Determinants of Access, Participation and Learning Outcomes at Primary Level in Nepal

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Declaration

I hereby declare that except where explicit attribution is made, the work presented in thesis and research on which it draws is entirely my own work.

Signed Min Bahadur Ranabhat

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Abstract

Nepal's national education strategies have sought equitable access and high quality education for all primary children.

Progress towards Education For All (EFA) was examined through secondary data using trend analysis with regard to access, participation, equity and exclusion at primary level. Original research investigated learning outcomes in basic reading and arithmetic using an Annual Status Education Report (ASER) type survey. Quantitative methods were used to isolate factors showing high association with access and quality of education.

A first analysis employed the Ordinary Least Square method with univariate and multivariate levels of estimation of student performance at school level. A second analysis applied Logistic Regression (univariate and multivariate level) to estimate the key predictor variables at an individual student level. In both analyses the models were employed at three levels of significance.

Findings showed inequitable or non-inclusive enrolments and substantial disparities in access and participation particularly in ethnic minorities.

There are major quality concerns: from the ASER type testing the majority of rural primary school children were unable to carry out basic number recognition and computation or simple reading in the Nepali language. This was particularly the case for girls and those from the lowest economic quintile.

At school level, factors of student attendance, student teacher ratio, textbooks, and school location were statistically significant in relation to learning outcomes, however teacher training and qualifications were negative beta coefficients. At individual level, student characteristics and family factors such as gender, parental education, annual income and parental support were the most important in relation to student performance.

Large disparities persist between geographic regions and underserved social groups with a disproportionate impact on girls, the poor and the most vulnerable ethnic minorities. Major hurdles remain to secure satisfactory outcomes for all in primary education in Nepal and achieve the EFA goals of universal quality primary education by 2015.

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Acronym

ASER	Annual Status Education Report
APTIS	Testing English from Levels from A1-C on the Common European Framework of Reference for Language
BPEP	Basic Primary Education Project
CBS	Centre Bureau of Statistics
CDC	Curriculum Development Centre
CERID	Research Centre for Education Innovation and Development
CREEATE	The Consortium for research on Educational Access, Transition and Equity
CV	Coefficient of Variance
DEO	District Education Office
DfID	Department of foreign International Development
DOE	Department of Education
DPs	Donor Partners
ECD	Early Child Development Centre
EDSC	Education and Development Service Centre
EdQual	Research for Development Implementing Quality Education in Low Income Countries
EFA	Education for All
EFP	Education Production Function
FS	Flash Survey
GER	Gross Enrolment Rate
GON	Government of Nepal
GMR	Global Monitoring Report
HCT	Human Capital Theory

HDI	Human Development Index
INGO	International Non Government Organization
ILTES	International English Language Testing System
JEMC	Janak Educational Materials Centre
KCPE	Kenya Certificate of Primary Education
MDGs	Millennium Development Goals
MOE	Ministry of Education
NCED	National Centre for Education Development
NESP	National Educational System Plan
NER	Net Enrolment Rate
NFEC	Non-formal Education Centre
NFE	Non- Formal Education
NGO	Non Governmental Organization
NLSS	Nepal Living Standard Survey
LDCs	Least Develop Countries
OBC	Other Backwards Classes
OC	Opportunity Cost
OCED	Organization for Economic Co-operation and Development
OCE	The Office of the Controller of Examination
OLS	Ordinary Least Square
PEDP	Primary Education Development Project
PISA	The Program for International Student Assessment
PIRLS	The Progress in International Mathematics and Science Study
PROBE	The Public on Basic Education
PTRs	Pupil Teacher Ratio
RECOUP	Research Consortium on educational Outcomes and Poverty

RED	Regional Education Directorates
SACMEQ	South and Eastern African Consortium for Monitoring Educational Quality
SC	Scheduled Caste
SD	Standard Deviation
SEDP	Seti Education Development Project
SLC	School Leaving Certificate
SMAT	Standard Maths Achievement Test
STAR	Tennessee Student/Teacher Ratio
SSRP	School Sector Reform Plan
SPSS	Statistical Package Software
ST	Scheduled Tribe
TIMSS	Third International Mathematics and Science Study
TRSE	Technical Review of School Education
UNDP	United Nation Development Programme
UNSECO	United Nations Scientific Education Cultural Organization
UPE	Universal Primary Education
VDC	Village Development Committee

CHAPTER - ONE

INTRODUCTION

1.0 Context of Nepal

The purpose of this chapter is to present the current educational status of Nepal and to briefly describe the school system and its challenges and constraints. The rationale for the study, the aim of the research and the research questions including research hypotheses will also be included in this chapter.

Nepal is a country of great diversity. Topographically, the country is divided into three eco-belts ranging from east to west namely the Mountain, Hill and Terai. In the Mountain region high altitude, arctic and inaccessible conditions dominate, while the lower hill ranges have relatively easy accessibility and the Terai lowlands covering altogether Indian border have a comparatively good physical infrastructure.

The Mountain region occupies 35% of the territory, the Hill 42% and the Terai 23%. In the Mountain and Hill regions, because of the rugged nature of the terrain, it is more difficult to deliver and provide access to educational programmes and activities. The Terai comprises 23% of the total area, and almost half (47%) of the total population live there. The capital Kathmandu hosts all the important functions of state and commerce. The Kathmandu Valley now has a population of 2.5 million. For administrative purposes Nepal is divided into five Development Regions and 75 Districts.

Nepal is one of the richest countries in the world in terms of its human heritage and culture; the 2001 census recorded 103 distinct caste/ethnic groups and 106 languages and dialects. Minority ethnic groups are described by the term ‘Janajati’ (ethnic minorities are very varied including marginalised Janajati and advanced Janajati). 46.6% of the population claim Nepali as a first language. The majority have another language as their mother tongue. Some of these language groups are large, numbering over a million people, but 58 first languages have less than a recorded 10,000 speakers (Pradhan and Shrestha,2005) making them small and at risk. Linguistic diversity is clearly visible in most of the schools in Nepal. There are certain areas of Nepal that are strongly associated with particularly ethnic groups and their languages, but some groups are scattered across Nepal's entire length

and breadth. (Bista,1991). There are large areas, especially rural ones that are predominately monolingual. Minority language strongholds and pocket areas are concentrated in the southern plains, hills, mountains and inner valleys. The Kathmandu Valley itself is home to a large ethnic minority group, the Newar, a non-disadvantaged janjati group. The Government of Nepal's officially liberal policy towards languages other than Nepali may have contributed to encouraging linguistic minorities to come forward and give information on their mother tongues (CBS,2002).

Nepal's linguistic diversity is under threat because of the expansion and consolidation of both Nepali and English in the country. Both Nepali and English have an impact on children's mother tongues. The Nepali language has been a symbol of elitism due to its association with the ruling families and high caste people in the country (Awasthi, 2004). Thompson (2011) stated that 'Nepal's ethnic and linguistic diversity is key to its social and political situation and plays a part in debates about development (Shields and Rappleye, 2008). Issues of injustices, inequalities and rights are now central to political debate (Gellner 2005, Mathema 2011). They are also central to ongoing violence, disruption and political agitation'. This includes popular support for the Maoists during their insurgency and the Madhesi uprising in the Terai in 2008.

Non-Formal Education (NFE) is one of the essential programmes designed for illiterate adults which is widely accepted as well as requested in Nepal particularly in the rural and difficult hilly and mountainous geographical areas. The government of Nepal has been offering this program continuously since the last three decades.

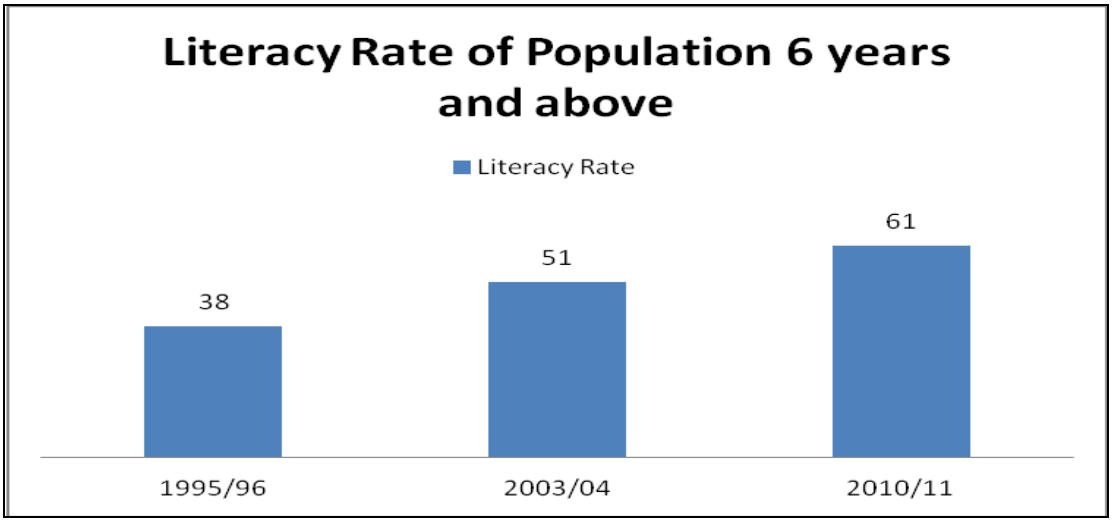
Literacy is the ability both read and to write. A literate person is one who can both read and write a short, simple statement in any language in his/her everyday life (NLSS,2010/11). In the Nepalese context, Non-Formal Education (NFE) is seen as a bridge for school aged children intended to increase the literacy rate and provide life skills to women through literacy and life skill classes. The government undertook several initiatives over a period of time, targeted basically at promoting literacy in the country and much of the activity of non-formal education centres is directed towards this. The NFE program comprises four elements; an adult Literacy program (targeting a population of 15 to 45 years of age), a female literacy program

(especially for women and girls), an out-of-school program (for those who missed or who dropped out of formal schooling) and alternative schooling adopting a non-formal approach to delivering a consolidated formal curriculum to enable completion of primary education within three years. There are some additional activities such as flexible schooling, school outreach and income generation programs under the NFE program. As in formal schooling, the intention is that the ethnic minorities, for example, marginalized Janajati, Dalits and in particular for women in the 30 districts with very low literacy rates will participate in these programmes.

In terms of policy initiatives, the government has prepared 'a ten year literacy/NFE policy and program framework' for enhancing the literacy rate and achieving the goal of EFA (National Plan of Action, 2015). The Education for All (2004-09) core document also envisioned enhancing the literacy rate of the age group 6 years and above from 54% in 2001 to 76% in 2009. The Central Bureau of Statistics (CBS,2000) data showed that on average around 10% of the literate population became literate through non-formal sources. The demographic Health Survey (DHS, 2001) also showed that among literate females, around 17% attended formal literacy classes. These analyses indicate that formal schooling is the main contributor to literacy. At the same time, the contribution of NFE in literacy is higher for adults, for example, for people over 50. The contribution from NFE to their literacy development is more than 70% (CBS,2000).

Figure -1 demonstrate the trend of literacy rate of six years and above population during the fifteen year in between 1995- 2010. According to NLSS (2010/11), only 61% of the population aged 6 years and above is literate. There are marked disparities in terms of gender and geographic area (eco-belts, development regions and urban versus rural) in the literacy rates.

Figure-1 Literacy Rate of 6 years and above population



Source: Nepal Living Standard Survey (2010/11)

The literacy rate is substantially higher in urban areas (77%) than in rural areas (57%), western development regions (66%), with the lowest in the central development region (57%). The hills belt has the highest overall literacy rate (69%). There is a clear association between literacy rate and household consumption, with about 79% of the population in the richest quintile being literate while only 45% are literate in the poorest quintile. The gender disparities are greater in the rural-eastern area and the central Tarai, the mountains belt, and in the rural-mid and far western hills.

The TRSE study report (2006) indicated that NFE programs are conducted with a fluid organizational structure. They do not have a formal organizational structure like schools. User groups are responsible for managing the classes with financial support from the district education office. Service delivery at the grassroots is through loose institutional mechanisms through the formation of temporary users' groups. Delayed distribution of teaching materials is common. Weak delivery of education materials is a common phenomenon hampering the quality of NFE classes. So while NFE is an essential programme, weak delivery (production and distribution of textbooks), poor monitoring and centralized management are common phenomenon in the management of NFE over many years. The target of literacy in EFA (2004-09) is also under resourced in terms of financial resources.

Nepal is one of the poorest countries in the world. In 2011, it was placed 157th in rank in relation to its poverty out of 187 countries according to the Human Development Index (UNDP-2010). Around 80% of the population earn a living from agriculture and most people live in rural areas (Carney, Bista and Agergaard 2007).

A governmental human development indicator describes how the country is overwhelmed by poverty and inequality, with approximately 31% of the population living at poverty levels (43% in rural and 21% in urban areas). With 86% of Nepal's total population of 23.1 million (2005) resident in rural areas, subsistence agriculture remains the key productive activity. Regional disparity is apparent, with the mid-and far-western regions of the country having lower levels of poverty.

Gender disparity is evident amongst most communities; particularly among women living in the hills and mountains (Evaluation Nepal-Joint Government-Donor Evaluation of Basic and Primary Education-2004/2005).

According to the Nepal Living Standards Survey (NLSS) 2003/04, since 1995/96, the number of people living below the absolute poverty line has fallen from 42% (1995/96) to 31% (2003/04) and the rate has fallen further to 25.16% during 2010/2011. However, the proportion of poverty is high among disadvantaged communities and ethnic minorities such as Dalit (46%), marginalised Janjati (44%) and Madeshi Muslims (44%) are seen to be below the poverty line.

1.1 The Educational Context

In 1846 the Rana rulers seized power from the Shah (king) and controlled state affairs for 104 years. Modern education in the country was not available to the general masses until democracy was introduced in 1950, when the Ranas were dethroned. The pace and content of changes in the education sector since 1950 can be seen as resulting from the interplay of national political change and international influence and assistance. For example, the National Education Planning Commission established in 1953 received considerable technical support and advice from international communities. The National Educational System Plan (NESP) was introduced in 1971 to promote national unity and increase government control over the rapidly growing education sector through the nationalisation of

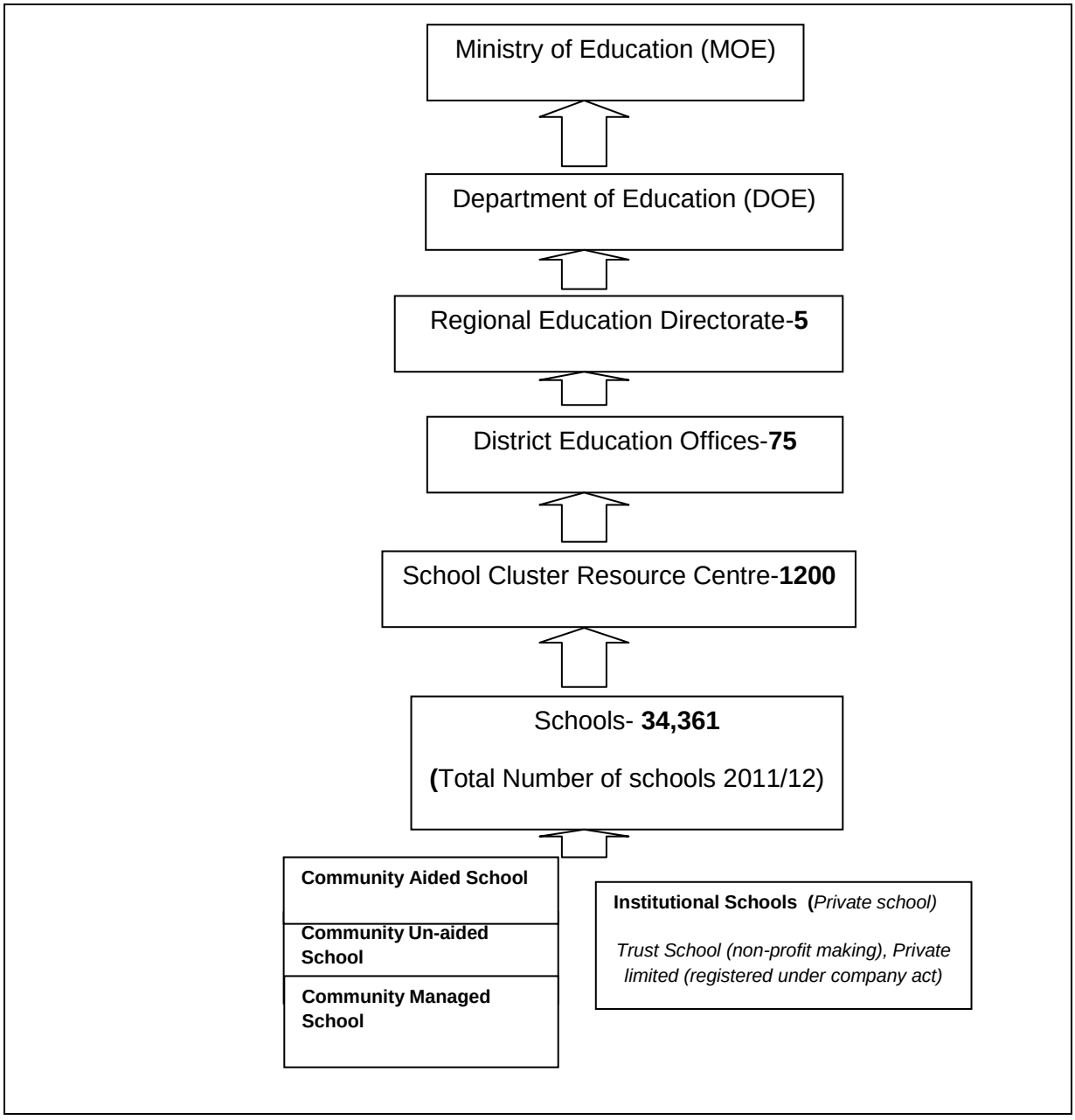
schools and the curriculum. In 1973, primary education (Grade I-III) was declared free, with the government taking responsibility for teacher salaries and the provision of textbooks.

Government schools are community schools, originally established by local community initiatives. These are expected to provide the capital funds to maintain and develop their school sites and provide extra revenue for teachers and other staff.

System management is through a district education officer (DEO) who has a small staff. The government organises initial and further professional teacher training. There is a National Curriculum and government textbooks which are provided free to government schools. Recently decentralisation has transferred some powers directly to schools.

In terms of administrative arrangements for the delivery of the services of all education programme and activities, there is a Department of Education, five regional directorate offices, seventy five district education offices and more than 1,200 school supervisors in place throughout the country. Figure-2 provides a clear diagram of the structure of the education system in Nepal.

Figure -2: Structure of Education Services Delivery Mechanism



Sources: Ministry of Education Nepal.

According to Flash Report I (2011), there are mainly two types of schools: community schools (supported by the government) and institutional (private) schools (supported by parents). Community schools fall into three categories, namely community aided, community managed and community unaided. The community aided schools receive regular central government grants in the form of teachers' salaries for approved positions, and earmarked and block grants. The unaided community schools do not receive regular government grants but fixed basic teacher salaries are covered and they receive block grants. The institutional

schools depend on parents' support and are managed and owned by individual or private and public trusts. There are a few religious schools such as Madarashas, Gumbas and Ashrams.

Private schools have been permitted to function since 1981 and have mushroomed in recent years especially in wealthier and urban areas. Urban areas have almost half of their school enrolment in private schools. Not surprisingly as these are fee-charging schools 44% of the students from the richest quintile are enrolled in private schools while less than 7% of the poorest quintile are educated in private institutions. These private schools produce better scores than state schools [as measured by the SLC exam in Grade 10]. They are inaccessible to the poor (NLSS 2003/4). Another aspect of their appeal to parents is that they are all English medium schools.

Nepal recognizes the importance of education and has achieved very creditable progress, particularly in access, over the last decade. The constitution of 1990 guaranteed the universal right to education and hence preferential policies for educating girls and other disadvantaged groups. The government has made significant efforts to provide primary education for children, especially for girls from disadvantaged backgrounds and ethnic minorities. There are schemes such as scholarships to encourage the participation of girls and disadvantaged groups.

The Tenth Plan for education (2001-2006) placed high priority on universalizing basic and primary education. The Plan focused explicitly on expanding and developing quality education and producing internationally competitive human resources for supporting the national economy, enhancing social development and contributing to poverty reduction.

The Three Year Interim Plan (2007-2010) envisaged the extension of education in the spirit of Education for All (EFA) and aspired to cope with the country’s low level educational outcomes through improving the low level of access and participation of girls, Dalit, ethnic communities and disabled children.

Furthermore, Nepal has pledged commitment to Education for All, and made substantial progress in the field of education over the last decade. This has resulted in the expansion of a nation-wide school education system for all levels. For

example, the network of primary and secondary schools has considerably increased throughout the country, facilitating access to school. At present, there are more than 33,000 community schools (Flash Survey-2012) functioning compared with 1972 when the country had about 4,000 community schools.

Almost all education indicators showed a very noticeable improvement between 1995/96 and 2003/04; the primary school Net Enrolment Rate (NER) increased from 57% to 72%. However, during year 2010/2011 NLSS data showed that the NER had fallen to 68.8%. However, the increase in NER was higher for females from 66.9% in the year 2003/04 to 70.2% in year 2010/2011. Private school participation rates rose from 7% to 17% during the same period and reached 26.8% during 2010/2011(NLSS 2010/11).

1.2 Rationale for the study

The evidence currently available regarding Nepal's educational progress is mostly of a descriptive nature, and mainly undertaken by the government. Therefore, there is a lack of independent rigorous research to tease out issues that pertain to progress in terms of equity and inclusion towards EFA. A further issue is the learning outcomes. Researching equity, inclusion and learning outcomes would help inform the direction of education planning and government efforts not only towards the 2015 targets but also in the post-2015 national educational agenda.

There are many significant determinants of access and participation as well as a host of factors that determine learning outcomes. These factors form a chain and the chain varies from one country to another. So what might inhibit access in one developing country is not necessarily the same factor that would inhibit access in another. Therefore, there is no 'one size fits all' manner of addressing access and learning outcome issues. This necessitates the need to have contextual analysis of these factors and to identify the strongest and weakest parts of the access and learning outcome chain.

This study, therefore, aimed to identify the key determinants of access, participation and learning outcomes in Nepal, and compare the findings to those already known in the international literature, and by doing so, highlight areas to which policy

attention needs to be directed in order for Nepal to meet its EFA 2015 commitments.

Initial enrolment, progression, retention, completion and transition are considered, as these factors capture the internal efficiency of an education system in so far as access is concerned. The other aspect of international test relates to learning itself, often measured by competencies in numeracy and literacy as well as achievement in the core subjects of science, maths and language from various studies for e.g. TIMMS, SACMEQ, and ASER.

Although the Government of Nepal has developed several policy and programme initiatives to ensure the right to education for the whole nation, specifically at primary level, there are several challenges to the system. The overall strategy of Education for All (2005-2009) and the School Sector Reform Program (SSRP) (2009-1015) has emphasized equitable access to education and a high quality education for all primary school aged children.

There was a high dropout rate (15%), repetition rate (34%) and a low level of progress (51%) in 2002 and the low primary completion rate (76%) has persisted over the last five decades in the school education system (UNESCO, 1994). These factors not only indicate the inadequacies in the education system, and the disconnect between policy and reality, but they also have social and economic consequences if education is considered to be the greatest equalizer in society. Moreover, research has shown that once children drop out of basic education in developing countries, they rarely return to the formal education system, making the realisation of EFA targets unattainable (UNESCO, 1994).

Studies in Nepal have identified the antecedents of high dropout rates, repetition and low levels of promotion and primary completion rates that include family income and poverty (CERID,1981, 1987; Koirala,1997), household work (CBS, 1998, 1999, 2001), parents' level of education (CERID 1984a, 1984b), family size (CERID,1987), grade repetition (CBS, 2001; CERID, 1987), and poor health and malnutrition (CERID 1983; and New Era, 1982).

Despite many efforts, such as the Primary Education Development Project, (1995-2000), Education for All (2004-2009) and School Sector Reform (2009-2015), progress in attainment in education at primary level remains dismal and major challenges in education still exist. For instance, the EDSC established that the mean scores for Nepali were 45.6, 44.5 and for maths 43.8, 47.0 respectively in 1997and 2001. There has been a relatively low increase in participation and achievement among girls from disadvantaged communities. Furthermore, there are large gaps in schooling participation between regions (eco-belts, districts, rural/urban) and between social groups such as Dalit and Janjati (TRSE-2006).

Wide disparities still persist in relation to gender, socio-economic status, geographic region, ethnic minorities and disadvantaged communities. TRSE (2007), showed that the NER at national level was more than 89%, but there remained some pockets of real disparity. For example, in the remote mountain district Manang, the NER was only about 40%. Furthermore, the figures are substantially lower for ethnic minorities (59%), Dalits (63%) and Muslims (less than 50%).

At national level, the dropout rate is 23%, whereas for Dalits it is 50%. In terms of intra-district variation, there are only 45% (35 districts) which have less than the national average dropout rate (TRSE-2006).

There is a low level of staying on survival rate (pupils starting in Grade I and reaching Grade V). The retention rate was 47.0% in 2005 - an increase from 45.7% in 1995, growth of less than 2% in a decade (Flash Survey - I, 2006).

Likewise, social inclusion and equity issues continue to prevail as the major concern across all levels of education delivery. With the low levels of learning achievement (the mean score is less than 50 in maths and Nepali) and persistently high drop-out and repetition rates, the efficiency and effectiveness of primary level education presents another challenge to be met (SSRP, 2009).

Despite noteworthy policy initiatives for the further improvement of primary education in Nepal leading to significant progress during the last decade, huge problems relating to drop out, repetition and completion rate still exist.

The government has declared that these educational statistics indicate that the quality of education is low and a major concern in primary schools. The low level of progress, high repetition, and dropout rates suggest educational wastage and an inefficient education system. About 13% of the current school going population at primary level (5-9 year age) are still out of school

The majority of rural primary school aged children are unable to carry out basic levels of numerical calculation and computation (e.g. addition, subtraction, multiplication and division) and simple reading and correct writing (e.g. word, paragraph and story) in the Nepali language remain very low, particularly for the lowest economic quintile of learners. Huge problems, challenges and hurdles remain, particularly with regard to equitable access to quality education policy commitment, education planning, resource allocation and outcomes in the primary education sector.

A number of EFA educational indicators show that if the same trend continues, it is highly likely that the EFA/ MDG targets will not be attained by 2015. Overall, primary schooling enrolments are uneven (year on year increases or decreases), and there are substantial disparities in school participation rates and progression outcomes, for example, internal efficiency, primary cycle completion rates and learning outcomes (numeracy and language). These disparities persist between geographic regions, districts and at village level areas for all deprived groups including women, *Dalit, Janajati, Madeshi*, the disabled, the poor, and the most vulnerable ethnic minorities. The link between equitable access to quality education policy commitment, investment and implementation of plan is often weak or not supported by the required budget allocation.

Currently, the country is in the process of political transformation. The administrative arrangements of the country both in terms of number and features are likely to change, and this will have a significant impact upon the education administration. For example, the existing primary level (Grade I-V) will now be extended to grade eight in the school education system. As a result, there will be a need for significant restructuring in the existing resource allocation pattern and the government’s commitment to free primary education.

1.3 Aims of the Research

The aim of this research was to investigate the key determinants of access, participation and learning outcomes at primary level in Nepal in relation to key educational input variables and their outcomes. The key educational input variables to be included are: the teachers characteristics (e.g. qualifications, experience and training), pupil-teacher ratio and school facilities such as school buildings, instructional materials, library and the availability of textbooks. Furthermore, the research set out to examine the relationship between inputs and educational outcomes such as access, retention, completion rate and learning outcomes of primary level education for girls and disadvantaged groups in Nepal.

The EFA key educational outcome indicators such as Gross Enrolment Rate (GER), Net Enrolment Rate (NER) and internal efficiency (promotion, repetition, dropout rate) and primary cycle completion rates were analysed for the period from 1990 to 2009 to demonstrate the trend over this period. School participation rates were analyzed, especially for geographical eco-belts (government educational statistics and data - Flash Report comprises the Mountain, Hill, Terai and Kathmandu valley), girls, and different social groups (Dalit and Janjati).

Statistical methods of correlation and regression equations were used to investigate the relationship between educational input variables (independent) and outcomes (dependent).

These analyses demonstrate which variables are the most significantly associated with improved school participation rates at the primary level for each of the regions. Additionally, the enquiry endeavoured to determine which input variables were significant or insignificant for children's learning outcomes and school effectiveness for each region. Furthermore, this should indicate and suggest to policy makers which changes are the most promising ways of improving children's learning performance.

Finally, this thesis sets out suggestions and recommendations for further improvement in terms of the equitable, inclusive access to and also quality education of the existing primary education system in Nepal.

1.4 Key Research Questions

This research set out to explore the constraints and issues associated with achieving targets on access and the key determining factors associated with learning outcomes. The key determining factors on access and learning achievement were: (I) Retention to the end of the school year, (ii) Promotion to the next grade, (iii) low dropout rate, (iv) low grade repetition rate; high primary school completion rate, and (V) the level of learning outcomes and competencies in numeracy (maths) and literacy (Nepali) in primary aged - pupils.

In reviewing current access to education including the participation rate of school aged children at primary school, particularly of girls from poor, disadvantaged and ethnic minority communities in Nepal and with particular reference to education, three major research questions were considered:

RQ 1: To what extent is Nepal's progress towards Education for All (EFA) inclusive and equitable?

1a. What has been Nepal's progress in access to education through school enrolment rates at primary level (Grade I-V) over time (1990 to 2010)?

1b. How have these key EFA educational outcome rates (Primary completion, Drop-out, and Repetition Rate) changed over time?

1c. How close is Nepal to achieving the EFA and is it achievable by 2015 irrespective of gender, geography and ethnic minority/disadvantaged community school aged children?

RQ 2: what are the levels of Learning Outcomes in Nepal's education system in numeracy (maths) and literacy (Nepali) in primary - aged pupils?

2a. Are there learning outcome disparities by gender, geography, ethnic minority and disadvantaged communities in primary - aged pupils?

2b. To what extent are there differences in learning outcomes between government and private schools?

RQ 3: What are the factors that determine access, participation and learning achievement in the school education system in Nepal?

3a. Which family related factors, school related factors, teacher related factors and student related factors of these key input variables[1] are significantly associated with school performance?

3b. Which family background, school related factors, teacher related factors and student related factors of these key input variables are significantly associated with students' performance?

1.5 Tests of Hypotheses

Based on the impact of school related factors on learning achievements and evidence from the literature that some factors affect pupil performance, the following hypotheses were formulated based on the research questions and objectives of the study and to guide this investigation. The proposed hypotheses are that:

(A) Null Hypothesis (**Ho**): There is no statistically significant and positive association between the independent input variables and pupils' learning achievement.

1 There is no statistically significant and positive association between school-related independent input variables such as: teacher related factors, school-related factors including textbooks, school facilities, instructional materials and attendance rates of students and students' learning achievement.

2 There is no statistically significant and positive association between students' related independent input variables such as: age, gender, caste and language spoken at home and students' learning achievement.

3 There is no statistically significant and positive association between family background independent input variables such as: economic level, income, parental support at home, and parental education and pupils' learning achievement.

[1] **School related factors:** School infrastructures, instructional materials; Teachers; proportion of trained teachers, attendance rate of teacher; Student Teacher Ratio; availability of textbooks, attendance of student, and enrolment).
Family background factors (Parent education level, parental support at home to the children, economic level, income, family size, religion and culture), and
Student characteristics (age, caste, gender, ethnicity, health, language spoken at home and previous achievement).

(B) Alternative Hypothesis (**HA**): There is a statistically significant association or there is a difference between independent input variables.

1. There is a statistically significant and positive association between school related independent input variables such as: attendance of teachers, availability of trained teachers, textbooks, school facilities, instructional materials and attendance rates of students and pupils learning achievement.

2. There is a statistically significant and positive association between student related independent input variables such as: age, gender, caste and language spoken at home and pupils' learning achievement.

3. There is a statistically significant and positive association between family background, independent input variables such as: economic level, income, culture, religion, parental support at home, and parental education and pupils' learning achievement.

Overall, this research examined and assessed the current circumstances of school education by applying the Education Production Function (EPF). It will also used the Annual Status Education Report (ASER) tools pioneered by Pratham (a NGO established in Mumbai in India) to measure the learning outcomes of the children. A central purpose of this survey was to collect data for estimation of the learning outcomes of students at primary school in Nepal.

1.6 The Contribution of this research to the body of knowledge

Currently, there is little in-depth investigation and analysis of school quality in primary schools in Nepal. There is almost no data on the learning levels of achievement using standardized tests with the children at primary level. This research conducted a survey of learning achievement of primary school children in schools in order to gain new knowledge in this highly important area.

This research went beyond the existing research to also investigate the determining factors associated with the children's learning competencies (possibly this is the first time that this has happened using ASER type questionnaires in Nepal).

The model for exploring the determinants of performance which was used in this study adopted a more comprehensive and representative school survey than any

other model used in Nepal in terms of the range of determinants included. This study is also distinctive in terms of the statistics employed in analyzing the data. Since nationally, statistically representative school surveys generally involve multistage, stratified random sampling designs, the data resulting from such surveys have complex hierarchical structures that need to be taken into account at the analysis stage.

The research brings up to date the theoretical and policy debates on school resources and learning outcomes in developed, developing and low-income countries. It adds to knowledge about the nature of the internationalisation of education values and goals and their mode of action.

The literature review looks at a number of related and relevant reports in detail in the context of recent research, including access (determinants of enrolment and completion), quality and learning outcomes in primary schooling systems and includes new and recent policy initiatives and evidence about the quality of education in different contexts

The present research contributes to the literature on the determinants of school and student learning outcomes in developing countries in three ways. It uses diverse sets of community and school quality indicators to measure how family background, student characteristics and school related factors impact on the learning outcomes of the students.

The research should be of value to the government and the people of Nepal in understanding school resources and their impact on learning outcomes and identifying positive developments in educational policy initiative, to the country's advantage.

This research is an attempt to fill important research gaps and to discover the reasons and key determining factors associated with the learning outcomes of primary school children in Nepal. Furthermore, this research can contribute to the policy debate and how the existing schooling system can improve and efficiently deliver the required quantity and quality of education at primary level in Nepal.

1.7 Organization of the Thesis

This thesis is presented in eight chapters. The first chapter has provides a brief overview including rationale of the study, and research questions. Chapter two describes the research methodology. Chapters three and four describe the theoretical framework and the model employed in this study and there is a review of both international and Nepali literature and a description of the development of the Nepal schooling system, particularly for readers not familiar with the country. Chapters five, six and seven describes the data analysis and interpretation relating to access to education, and learning outcomes based on standardized test scores and regression equation analyses to investigate the key determining factors associated with school resources and student performance. The final chapter discusses and makes comparisons between the key findings of this research and international literature. The final part of this chapter provides key policy recommendations and directions for future research. Appendices provide supplementary details largely of the analysis relations to the regression equations.

CHAPTER - TWO
RESEARCH METHODOLOGY

2.0 Background

The purpose of this chapter is to present the process and steps underpinning this research, as well as to explain the empirical techniques that were applied. The chapter defines the scope and limitations of the research design, and situates the research amongst existing research traditions in information systems.

2.1 Use of quantitative methodology

According to Scott and Usher (1998) 'quantitative techniques are statistical or programming techniques which can provide the decision maker with a systematic and powerful means of analysis and help, based on quantitative data, in exploring policies for achieving pre-determined goals'.

This study's research questions seek to establish the key determinants in terms of input variables associated with learning outcomes in language (Nepali) and numeracy (maths) of children at primary school level in Nepal. The use of quantitative techniques to collect and analyse data is highly appropriate to the research questions. Quantitative techniques were used to enable understanding and determine the quantity (volume) of production in terms of output; how to maximise the outcomes and minimise the cost and improve cost efficiency; and the quality of the outcomes. Structured interviews, Focus Group Discussion (FGD), and standardised tests of performance contributed to the methodology.

This research aimed to answer the research questions by also using a mixture of both primary and secondary sources of data. The primary data were collected through a survey. The secondary data were collected from government documents, and previous research (for example, academic books, national and international journals).

The study is largely based on primary data collected from government and private schools through a nationwide survey of 30 schools and 600 students. The survey also includes 120 families, 30 head teachers, 120 class teachers from six districts.

The collection of data includes information on each student's performance (learning outcomes) as well as information related to the student's school and family background characteristics that could affect learning outcomes. A multi-stage, stratified random sampling approach was used to select the sample for the survey.

To determine the learning outcomes of the children, test scores were collected by adopting ASER type survey. ASER test is a most commonly used measure in investigating educational progress (ASER, 2007). At the individual level, the test scores were used to determine the achievement level of children at the primary level (Grades-II and IV).

The data were analysed using estimates of percentage, trend analysis, descriptive statistics (such as mean scores, standard deviation, coefficient of variation) and regression (the OLS and logistic). Also, intra-district variation was estimated by using percentiles, graphic charts and tables for further analysis. The flow of data and tables comprise national, eco-belt, district and school levels, and includes gender and ethnicity analysis.

2.2 Sources of Data

2.2.1 Primary Data by using Survey method

The survey used four types of questionnaire in each school. Data relating to the characteristics of the student, school, family and students' achievement (a test was taken at school level) were collected from each of these sources.

i. School Data collection sheet (main questionnaires)

ii. Student details - student data sheet form

iii. Head teacher (HT) Questionnaire - HT data sheet form

iv. Class Teachers Questionnaires - maths and Nepali teachers data sheet form

v. Test Paper for Student - ASER test sheet

vi. Family background Information - Household information sheet form

vii. A meeting with ministry officials, donor representatives and District Education Office.

Data were collected on students' individual characteristics including age, gender, caste, ethnicity, language spoken at home as well as on household background such as parents' education, income, family size and whether parents helped the children at home in their studies. For school related information, a school data collection data sheet was designed.

The intention was to use two separate tools to capture both basic objective data about the school through the school data collection sheet, and also the more personal and, in places, subjective material from the head teacher and subject teachers. The questionnaire was completed by each school head teacher and subject teachers. School related information was provided by the school's administrative office and including Head Teacher (HT).

Data collection from HT and subject teachers: Interviews were conducted to address aspects of the research questions confirming and exploring factual data from the school such as its foundation and growth, and seeking to capture and explore each interviewee's perspective on schooling. These data were treated quantitatively through the use of a check-list.

Learning Achievement Data: (Maths and Nepali Test): A Maths and Nepali test were devised and translated into Nepali. The test was administered to groups of Grade II and IV pupils with the help of class teachers, directly managed by research associates (who were hired, trained and assigned to schools) and the researcher himself with the full consent and cooperation of the school.

Formal and informal observation: A field diary was maintained throughout fieldwork time. Comprehensive note-taking of school visits and interview material to record other related evidence was maintained throughout the visit and linked, where appropriate, to data on specific schools; for example, the unique condition of school buildings or teacher recruitment problems.

2.2.2 Secondary data

This research focused on access to education by using secondary data published by government authorities (Ministry of Education, Central Bureau of Statistics, Centre for Educational Research and Development, the Nepal Living Standard

Surveys and Development Partners publications) also including the Independent studies in relation with the primary school education system in Nepal.

National and district level data was collected from several sources; the Ministry of Education (MOE), Department of Education (DOE) and District Education Office (DEOs) were the main official sources. During the trip to Nepal, the researcher visited the library at the Research Centre for Education Innovation and Development (CERID), Tribhuvan University (TU), Kathmandu University (KU) and UNESCO library and donor agencies (ADB, WB and others).

From the DOE, The School Level Education Statistics of Nepal (2002 to 2012) and Flash Reports I and II 2010 were obtained. Data on access was obtained to their series of research publications, particularly those produced within the Formative Research Project based at CERID in collaboration with EFA. Some of these documents are available electronically (see Table 2-1).

Table 2-1 Secondary data sources of written and published material and literature

Sources	Materials
Ministry of Education, Kathmandu (inc Website)	Policy documents, e.g. EFA plan, Master plan, BPEP document, Three Year Interim Plan and School Sector Reform Plan.
Department of Education (DOE) Sanothimi, (inc Website)	EMIS publications, including FLASH data and National School Statistics and Status Report.
District Education Office (DEO)	District Education Plans (DEPs),District Level Exam Past exam results, and list of schools
Schools	Prospects, leaflets, handbooks and school Improvement Plan
Research Centre for Education Innovation and Development (CERID), Tribhuvan University (TU), Kathmandu University (KU) and UNESCO library	Research Publication
Development Partners such as WB, ADB, UNSECO, DANIDA (inc. Websites)	Country publications for Nepal, including materials on past and current projects.

2.3 Analysis process

The analysis of the determinants of learning outcomes at primary level was performed by using an education production function that models performance as a function of different categories of explanatory variable.

A detailed discussion of the analytical framework used in this study is presented in the next chapter. A linear regression model was used to estimate functional relationships empirically. In addition, descriptions of the most important performance determinants are given using simple graphs and tables.

Firstly, the analysis focused on simple descriptive statistics for student performance, for example mean, median, mode, standard deviation and coefficient variation. It also presents comparisons of performance across geographic eco-belts including gender, and ethnicities. Multiple regression (univariate and multivariate) results show the relationship between student learning outcomes and the different performance determinants.

Finally, those factors which impact on the meaningful participation of school age children in education are identified with a view to increasing the internal efficiency of primary schools in Nepal.

Progression indicators in terms of annual growth rate are presented as a percentage based on one period of time (t1) to another (t2)[2]. In this research the expansion of schools and increased trends of enrolment will be shown in terms of annual growth rate. The rate of change in educational outcomes, were accessed by bringing together primary survey data with existing secondary data. The average growth rate and trend analysis covers a period of time from 1990 to 2010 also including data from 2011 and 2012.

The research focused on selected key educational variables which were: school related factors; teacher related; family background; and student characteristics. The regression equations (Ordinary Least Square for school level and Logistic regression at the individual level) were used to estimate for further analysis. Regression analysis was used to identify any associations between key input

[2] The annual percentage rate is simply the percent growth by N, the number of years. The formula is Percentage Change (PR) = (Value present-Value past)/Value past X 100.

variables and outcomes in an attempt to discover which variables seemed to be most significantly associated with better school participation rates and learning outcomes at the primary level of education in Nepal, and those variables where there was no such association.

2.4 Limitations of the Study

This study used a mix of primary data (researcher's own survey) and secondary data (published data) sets. The researcher approached DfID Kathmandu and as they were interested to know how this particular ASER model could be used in Nepal the survey budget was granted through DfID.

The study was constrained and limited by the problems of obtaining adequate statistical data and as a result. The full range of quantitative analysis that would have been preferable was not be possible. The first limitation lay in the secondary data source itself. In general, in low income countries there are no adequate, accurate and consistent data sets and even where they are available, often the data is unreliable.

Sometimes, even when data has been collected, and is reliable, it is held with a government authority, for example, the Ministry of Education which is unwilling to share the data with professionals and researchers. Nepal is no exception in this regard (TRSE, 2007).

There are often discrepancies and variations in the statistics and data that are available from documents and official sources. This is caused by various factors. However, it is most likely due to the different procedural and methodological approaches that have been applied for data collection, tabulation, and formulation of tables and numbers.

In this research, data limitations were overcome by the author himself conducting a unique survey of a sample of government schools and their teachers, students and families. This was a substantial survey, collecting a wide range of detailed information focused not only on children's learning levels but also on school, teacher, and household background factors that affect learning levels. A limitation of this survey is that the government schools were surveyed, the school having the

poor recording system found in many areas of Nepal, particularly in remote and difficult geographic areas.

The survey data used in this analysis did not adequately capture the processes through which knowledge is produced and learned by the student. A good understanding of the teaching-learning process, and the process through which input resources are transformed into learning outcomes, can only be gained through direct classroom/ school observation and observation of the student's home environment over an extended period of time. In the absence of good indicators for these processes, the analysis implicitly assumes that input resources are being used effectively and efficiently.

2.5 Sampling

Currently, Nepal has more than 33,000 primary schools, in five development regions, fourteen zones and 75 districts. About 13% are located in the mountains, 60% in the hills and 27% in the Terai districts. Out of the total population, more than 7% live in the mountains, 44% and 48% live in the hill and Terai regions respectively (CBS, 2002).

The mountainous and hilly nature of most of the country and the weak infrastructure (road, electricity and communication) would have made data collection from a national random sample of schools very time-consuming and expensive. The scattered settlements in the mountains and low population mean that it would have been lengthy and time-consuming to reach schools, households and parents in these areas.

Therefore, a multistage stratified sampling approach was adopted where districts were randomly selected within each geographic stratum, schools were randomly selected within each district, and students were also randomly selected within each school. This means that the data from the survey were clustered at different levels.

A stratified two stage random sampling plan was used. The process of stratification preceded the selection of sampling units at each stage. The country was divided into three strata, taking the eco-belts and five development regions into consideration. The three eco-belts are; Mountain, Hill and the Terai and the

development regions are; Eastern, Western, Central, Mid-Western and Far-Western.

Both the eco-belts and development regions show distinct variation in educational characteristics and therefore provide three natural strata. In addition, Kathmandu, the capital city, which has the most advanced educational provision outperforming other regions in Nepal, was considered as the sixteenth stratum for this study. In this way, the country was divided into 16 strata for the purpose of actual data collection (see Table 2-2) and six sampled districts were shown in Figure 2-1 below.

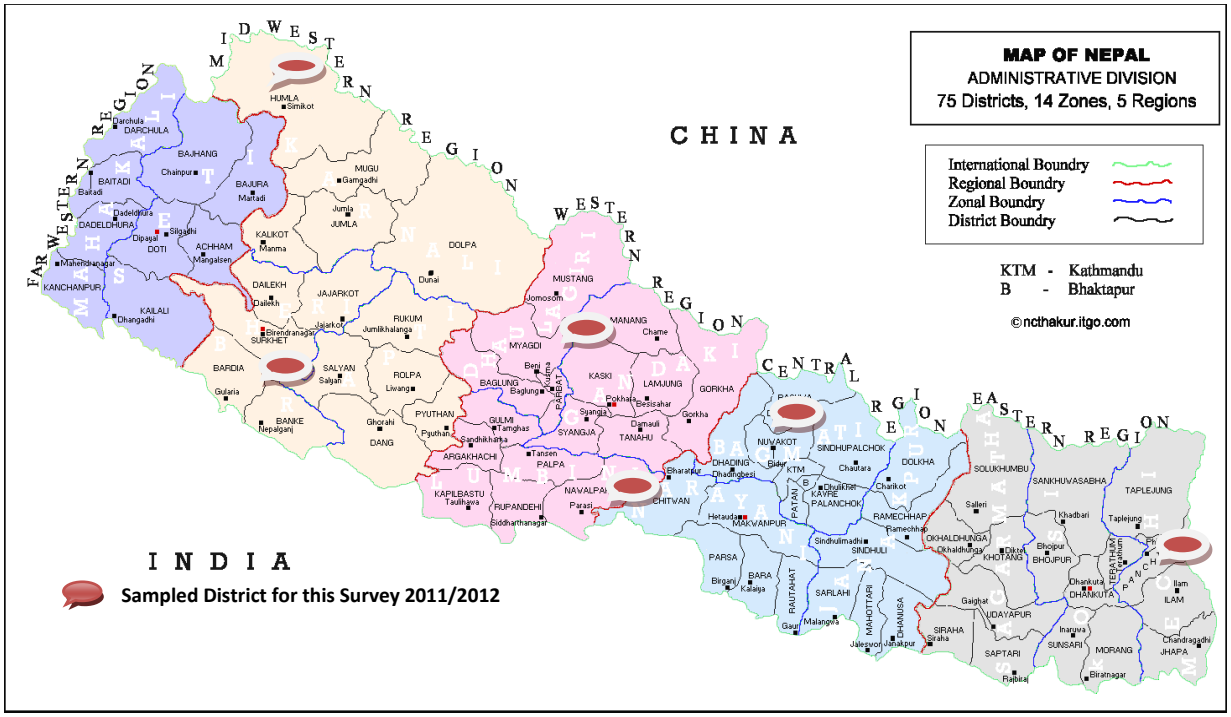
Table 2-2 The Eco-belts and Number of Schools for Sampling by strata

Stratum	EDR	CDR	WDR	MWDR	FWDR	Total
Mountain	-	-	-	4	4	4
Hill	6	-	6	-	-	12
Terai	-	4	-	4	-	8
Kathmandu	-	6	-	-	-	6
Total	6	10	6	4	4	30

Sources: Author calculation based on the Flash Survey (2010/11), Department of Education, Nepal.

Mountain : Mid-Western Development Region [FDDR], Humla, 4 schools
Hill : Easter Development Region [EDR] Ilam, 6 schools,
Western Development Region [WDR], Kaski, 6 schools
Terai : Central Development Region [CDR] Chitwan, 4 schools
Mid Western Development Region [MWDR] Banke, 4 schools
Valley : Central Development Region] [CDR] Kathmandu, 6 schools

Figure 2-1 Sampled Districts for Survey 2011/2012



2.5.1 A Short description about sample districts:

(I) **Humla:** The Humla district is one of the mountainous, remotest, poorest and backward districts in Nepal with no road access. One of the five districts of Karnali zone in Nepal's Mid-western Development region, it is bordered by the Tibet Autonomous Region of China in the north and west and with the Mugu district in the east. To get here, one has to fly to a small airstrip to the district centre Simikot and then travel by foot to reach other places within the district.

Almost all the people depend on agriculture although less than 2% of the total land is cultivatable. This makes living challenging and people find it difficult to meet their daily needs. The district has severe food deficits and people depend on getting food from outside their district. As a result, they suffer from malnutrition and other related diseases. This particularly applies to the children.

Humla is a multi-lingual society. Of the thinly-spread population, about 8%, are Bhotia people of Tibetan origin who speak Tibetan and are Buddhists. In contrast, the Southern part of the region is mostly inhabited by Nepali speaking Hindus (82%). According to the population census (1999), 19 different languages are

spoken in this district. There is a high child mortality rate (over 30%) and low life expectancy.

Health services facilities are negligible and the education system is very poor (for e.g. low NER, high GER, high dropout rate and low attendances are common phenomena). The literacy rate is 29% (female 9% and male 47% respectively); gender disparities are persistent across all school levels. GER is significantly higher than NER according to sex and levels of school indicating that there is both high repetition of grades and late enrolments. All students have to walk to reach their schools. There are few schools and 83% students spend at least half an hour commuting to school, while 4% have to spend more than an hour commuting.

(II) **Ilam:** It is located in the eastern part of Nepal. The district is formed of mountainous terrain. The mountain terrain in Ilam is made up of gentle slopes. This together with a moist climate provides a suitable environment for growing important cash crops such as tea and cardamom. This district comprises 48 VDCs and one municipality; Ilambazar is the district headquarters. It is almost 800 km from Kathmandu.

The Illam district has a diverse ethnic distribution, although the predominant ethnicities are Rais and Limbus which makes up about 38% of the population. There are also Tibeto-Burman ethnic groups including Magars and Gurung who make up about 17%. The Rais and Limbus reside mainly in the lower hills and valleys whilst the Magars and Gurung predominantly populate the higher hills. Altogether there are 13 different ethnic groups living in the district including Brahmin, Limbu, Chetri, and Newar including other marginalized groups such as Sherpas, Sunwars, etc.

The Eastern Hills are home to the Gurung ethnic group, a large janjati group who have their own language. This is a relatively poor district with many landless wage labourers, for example on tea estates.

The 2001 CBS recorded that the literacy rate of the population of Illam for children of 6 years and above of age was 66%. A large proportion of the population in Illam are mainly dependent upon agricultural work and foreign employment. According to the HDI of Nepal, Illam's child mortality rate per thousand live births is 51, where

Nepal's average is 69. The average life expectancy is 65 years, slightly more than the country's average figure which is 61 years.

(III) **Kaski:** Kaski district is located in the hills of the western region of Nepal. It has 43 Village Development Committees (VDCs), one municipality and one sub-metro city.

The district is a multi-caste society where people belong to the different caste/ethnic groups. The average literacy rate in the district is 56.8% (CBS,2003). Based on the over composite development index, Kaski it is ranked 5th best among 75 districts in Nepal. This district is easily accessible and has all the basic facilities such as heath-care, electricity, education, communication and entertainment (phones, internet access, satellite television and radios) with transportation facilities available for all VDCs and villages. Pokhara city is the headquarters of the western development region as well as being the zone and district headquarters. It is about 200km west of Kathmandu, the capital city and can be reached by plane in half an hour. This city is an emerging economic hub and is also a famous tourist destination visited frequently by many tourists.

After Kathmandu, Pokhara has some of the best private (and government) schools, colleges and universities throughout the whole country with advanced facilities for the students. Many families with high and medium income levels send their children to these schools. They achieve the best exam results and performance overall in the examination league table.

(IV) **Chitwan:** Chitwan is known as the second capital city as well as the heart of Nepal as it is located in the central part of the country. The district comprises two municipalities and 39 VDC. It lies about 150 km south of Kathmandu. Travel is easy by road and air. Chitwan is a newly emerging city where people from all parts of the country migrate to settle down. The main occupations are agriculture, business and services. Bharatpur, the district headquarters is the seventh largest city of Nepal.

In terms of ethnicity and cultural diversity, Chitwan is a very rich district where Brahmin/Chehetri is the dominant caste, although the Janajatis also constitute a large proportion of the population. The proportion of Nepali speaking population is about 70% with the remaining 30% being non-Nepali speakers. The percentage of

people who are literature in this region is about 82%. The population is dominated mostly by Hindus, followed by Buddhists with a small percentage of Islamists and other religions.

(V) Banke:

Banke is one of the central points for the mid-western and far-western development regions. The majority of the government regional offices, bilateral and multilateral donor partners offices and a large number of INGOs and NGOs are located here. These organisations offer development activities in various parts of the region. Nepalgunj, the district headquarters has one of the busiest domestic airports reaching to almost all the hilly and mountainous districts of this region.

The district is populated with inhabitants who have originated mainly from three different groups: hill-migrants, indigenous nationalities known as Janajati and Tharu, the remainder being of Indian origin.

This district is composed of multi-ethnic religious and caste groups such as Brahmin/Chhetri, Tharu, Muslim and Dalits. In terms of language, they speak Abadhi/Nepali, Hindi, Tharu and Urdu, although the majority of the population understand and speak fluent Nepali, the national language. Nepali is used as a mother tongue among all the hill-originated ethnic-caste groups.

(VI) Kathmandu: The capital is part of a large conurbation with many internal immigrants from other parts of Nepal. The population has increased because of ten years of conflict. It is the wealthiest area of the country with HDI scores double those of Humla. The facilities are excellent in terms of services and job opportunities. It has a large and predominantly young population who seek better opportunities in terms of education and employment. The government's central offices are based here. Other infrastructure such as healthcare, entertainment and the international airport are located here which means that there is much work.

With almost three times more private schools than government schools, Kathmandu also has some of the best international schools providing first class education and tutoring. The learning environment in these schools is outstanding demonstrated by their strong academic attainment. Table 2-3 sets out the details of the various districts.

Table 2-3: Summary of educational characteristics of the sampled districts

Educational Indicator	Humla	Banke	Kaski	Chitwan	KTM	Ilam	National Average
Number of schools	123	409	638	530	1,370	485	34,361
NER	95.8	96.1	98.4	96.6	98.6	97.6	94.5
GER	216.7	155.6	131.0	116.7	134.2	106.7	139.5
Dropout Rate	10.4	4.6	4.1	3.5	3.0	7.3	6.0
Repetition Rate	22.4	10.6	5.0	9.3	2.2	11.9	12.1
Promotion Rate	67.2	84.8	90.9	87.2	94.8	80.3	81.9
Attendance Rate	76.4	83.7	87.6	66.7	77.2	75.4	77.2

Sources: Flash Report I (2010/11), Department of Education, Bhaktapur, Nepal

2.5.2 Sampling Procedure

After forming the strata in the above fashion, a two stage sampling process was adopted. The districts in all the strata were considered as the Primary Stage Number (PSU), and were sampled in the first stage. In the second stage, the desired number of schools was randomly selected from each of the selected districts in all strata. The details of the selection procedures are described below:

First Stage of Selection: In the first staged selection, six districts (PSUs) were chosen from among the 75 districts in all strata. The selection procedure was carried out independently for all the strata under consideration. The districts were chosen by a random - selective process using two criteria: place in HDI index of districts [UNDP 2006], and secondly, recorded level of educational performance, as measured by outcomes from the government FLASH studies 2008. Districts selected for the study were those ranked in 1st place [top], 36th place [median] and

75th place [bottom] by each of the two criteria. These six districts cover Mountain, Hill and Terai geographical belts, and also the five development regions.

Second Stage: In the second stage of selection, all sampled community schools were selected randomly from amongst the total number of schools in the selected districts mentioned above. The list of schools in each district for 2010 was obtained from the Department of Education (DOE) and was used as the sampling frame.

2.5.3 Sample Allocation

The allocation of sample size by stratum followed proportional allocation based upon the total number of schools by strata. The national distribution of schools by strata [see Annex 2] was Mountain 13%, Hill 60%, Terai 27%. Thereafter, the size of the sample for a stratum was further distributed proportionately among the sampled districts in proportion to the total number of schools in the stratum. For example, 60% of the total sample was selected from the 3 Hill districts, meaning 20% of the total sample from each of these districts: 5 schools per district. This procedure of allocation was replicated for all the strata (see Table 2-4).

Table 2-4 Selection of the sample districts

Criteria/ Indictors	Top Performer Districts	Medium Performer Districts	Low Performer Districts	Total
Human Development Index (HDI)	1 (KTM)	1 (Chitwan)	1 (Humla)	3
Education for All (EFA) Indicators	1 (Kaski)	1 (Banke)	1 (Ilam)	3
Total	**2**	**2**	**2**	**6**

Sources: Author calculation based on the HDI Report (2006), UNDP and Flash Survey (2010/11), Department of Education, Nepal.

In each sample district, the required number of sample schools was selected randomly from the list of schools obtained from the Department of Education (DOE). Some factors (e.g. a local festival holiday) may have meant that some of the sampled schools could not be reached. To accommodate this, two other schools were randomly selected in each district as reserves to ensure full completion of the

survey. It was very important that this sampling strategy worked effectively in order to avoid limitations in the research.

2.5.4 Rationale for including the private schools in this study

The sample was chosen to include private/institutional schools now found across Nepal as well as government schools. The private schools form an important sector, making a contribution towards Nepal's overall educational goals and to the education of primary age children, the subject of this study. Other studies in Nepal have often omitted private schools, and therefore give an incomplete picture of what is happening. This may be because some research studies were funded by the government or by donor partners working with the government to find and analyse data about government schools only.

Private schools were included in the sample in proportion to their percentage of all schools in Nepal, which is approximately 20%. They were included in the sample districts as a minimum of one private school per district, with two private schools in the Kathmandu District where private schools are more common. Efforts were made to select a range of private schools in terms of exam performance, school size, etc, with very successful schools selected in Kaski and one in Kathmandu with a range of other schools elsewhere, taking advice from DEOs. Private schools are much more common in urban areas and so these were urban schools - though urban in Kathmandu is very different from urban in Humla where there is only one private school in the entire district.

2.6 Survey Instruments

The survey used broadly two categories of instrument namely the questionnaires (school level data, Head Teacher (HT), and subject teachers detail sheet, and detail of the sample children and tests for them. These were the major survey instruments and activities that were used to collect information during the school survey. These were used for the sampled schools including HT, subject teachers (Maths and Nepali) and students. Regarding testing the children, a total of 20 children per school were tested (10 children from Grade II + 10 children from Grade IV = a total of 20 children X 30 schools = 600 children) in the six sample districts and 30 sample schools.

Part - A Description of the main questionnaire

The school survey form (questionnaire) was the main tool and primary source for collecting the data and information for the survey. The school teachers and HT provided the required set of information to complete this form. The researcher and research associates visited each sampled school to obtain this set of information. The main questionnaires comprised four sections with different sub-headings as given below:

Section 1

School identification: This section included basic information regarding the identification of schools such as the location identified by development region, ecological region, district, school level and school type (government versus private schools).

Section 2

School Infrastructure: This section covered the main facilities at the school. Facilities covered were library, laboratory, status of classroom, and number of toilets, water supply, instructional materials (blackboard, maps, and charts), electricity, telephone, computer, and internet and play ground. As well as focusing on these 'input' variables, research was keen to capture information on the functioning of the school. Information was collected relating to the time that free text books were received by the children.

Additionally, the research wanted to capture information on actual school opening during this year and the actual number of days that the school was open in the previous school-year. Actual here means that the enumerator checked and verified with the school register.

Section 3

Enrolment: This section dealt with enrolment in Grades I - V, and by age, gender, caste and ethnicity. It also includes data for the pass rate by gender in Grade V (This was used as the primary cycle completion rate).

Section 4

Attendance of student: This included a head count during the school visit by the researcher who verified the attendance record as marked by the teacher.

Part - B Nepali and Maths Teacher

Teachers: Teachers' characteristics are likely to be an important input into the skill acquisition of the sample students who completed in the ASER test. This section included information related to teachers. The questionnaire aimed to collect information mainly on their age, gender, level of qualification, years of experience and training status. Furthermore, a separate form was developed for 30 sampled school Head Teachers (HTs). They were asked about their gender, caste, familiarity with the local language, as well as level of qualification, years of experience as a HT and training details. The questionnaires mostly had closed type questions with multiple choice to provide this information.

Part - C Test for Children

From each sample school, a total of 20 students (10 from Grade II and 10 from Grade IV, with equal proportions of boys and girls and at least one boy and girl from Janajati and Dalits communities) were randomly selected with the help of the class teacher using the attendance register. Before the start of the test and information collection, the participating students received an explanation about the procedures and ethical issues. If they did not feel comfortable and were unwilling to participate further in this process, they could drop out at any time.

Firstly, the student related information was captured by using the student information sheet. This form was designed in order to obtain information about the student such as age, gender, language spoken at home, and ethnicity.

Secondly a test was conducted using the ASER tools for maths and Nepali. The main aim of the test for the children was to provide a reasonably complete picture of learning outcomes in numeracy and literacy skills in Grade II and Grade IV in Nepali, and maths.

2.7 A short description about the ASER Tools:

The ASER tool measures the learning and performance of primary school aged children. It was administered to each child separately at school or at home. This process was undertaken to provide a snapshot of learners' competencies for each grade of children and also to find out to what extent they had learned, i.e. the level of their learning since they had started school.

ASER means 'impact' in Indian word and in Nepali as well. It measures the learning outcomes of primary school aged children, which is a concern of government, development partners and stakeholders, i.e. whether or not children are learning in the school system. The ASER centre design and use a simple yet rigorous method to generate new evidence for action, and disseminate it widely across the country. It enables the exploration of trends in children's educational status over time in India. The main objectives are to provide a reliable estimation of the status of children's schooling (whether a school aged child is in school or not, what type of school) and basic learning competence in language (reading) and numeracy (arithmetic) at the village and district level (Sources- ASER, 2007). Created and extensively used in India since 2007, ASER has been used across the globe including Pakistan, Bangladesh, East Africa (Kenya, Uganda and Tanzania), and Guinea Bissau. Many countries such as Mali and Senegal are planning to use this tool in the future.

- Appropriateness of the ASER Tool

It is appropriate to use this tool due to the similarities in the education system, life style, religion, socio-cultural, geography and economic situation in particularly the northern belt of Indian states such as Uttar Pradesh, Asham and Patna with the borders with Nepal.

The ASER tool and methodology are being used for the first time in Nepal to generate a new set of evidence to measure the learning outcomes of primary school aged children. The main purpose of this survey is to collect reliable, first hand data to estimate primary level student performance and levels of basic learning in numeracy and literacy at school.

The test paper (originally the ASER tool was in English and Hindi script) was translated into Nepali. The test was then administered in Nepali, the national

language, in all of the schools regardless of the language backgrounds of the students or the school's official language of instruction.

It was regarded as fair to test in Nepali whatever a student's language background or a school's medium of instruction. This was because Nepali is a compulsory subject in the National Curriculum taught in all schools including private schools, with usually a daily one hour lesson; Nepali functions as a lingua franca, is the language of the media and is usually the second language for bilingual language users; the tests operate at a simple language level, for example, alphabets, word recognition, easy and simple paragraphs and simple stories. The use of Nepali was successful in the Pilot phase.

The survey instruments were designed to establish the learning level of primary school aged children in Nepal. The ASER test content was reviewed in relation to the National Curriculum for each age group, taking into account that the test was being administered quite early in the Nepali school year. For example, the alphabet, words and sentences in the Nepali test and in maths very basic number recognition skills (signal and double digits), subtraction and divisions were reviewed to ensure that they were accessible to pupils from, for example, a rural background. The test items used are in Appendices (IA) together with an English translation of the Nepali test.

The ASER method of testing is different from the usual school exams experienced by the children. School tests (end of each term, plus at mid-point and end of school year) are written tests in the upper grades, while in the early grades (ECD and grades I &II), there is an oral and written component.

The methodology developed in India to administrate the ASER test uses the method of random selection of households with children within the randomly chosen study village. The research then tests any children of primary age in each household, also recording other data, e.g. type of school the child attends. Initially, tests randomly selected were administered only to children in two specific school years, grade II and IV in order to generate comparable data across the fieldwork. Secondly, the testing was conducted at school rather than at home. This was a pragmatic decision based on the often scattered settlements with a widely distributed population especially in the mountain and upper hilly areas and the uncertainty of finding

children actually at home and available for testing. Table 2-5 sets out the methodology as devised for use in India.

Table 2-5 Method of ASER conducted in India

SN	Feature	ASER
1	Class-wise test	Common test
2	Single Agency	Facilitated by Pratham and carried out by local organizations or institutions in different district in India
3	Tested in school	In homes
4	Classes tested	Ages 6-14 years
5	Coverage	Rural
6	Testing Tools	Short test with items in oral reading, subtraction and division in maths, and in Language recognition of alphabets, words, text and simple story.
7	Analysis	Achievement data sets of states in India.

What are learning Outcomes?

Learning outcomes are statements of what a learner is expected to know, understand and be able to demonstrate after completion of learning. They are essentially student centred or learner centred. They seek to describe the student's learning process in terms of knowledge acquired, the comprehension of that knowledge, the capacity to apply it, the capacity to analyse, synthesise and evaluate. Learning outcomes guide the selection and coordination of appropriate content, learning activities, and assessment strategies that promote the overall learning process. Quality of student learning can be monitored against the expected performance for these learning outcomes.

Sources: Student Learning Study, Educational Initiatives Pvt. Ltd, 2009.

- How many student attend the ASER test:

The survey instruments were designed to establish the learning level of primary school aged children in Nepal. A short test in Numeracy (Maths) and Language (Nepali) was administered to randomly selected students (equal ratios of boys and girls) in the 30 sampled schools, in each case with a target group of 600 students (10 students for Grade II + 10 students for Grade IV = a total of 20 students from each school X 30 sampled schools). When selecting the students to take the test

due consideration was given to the prevalence of major ethnic and language groups and having at least one boy and one girl from the Janajati and Dalit population.

The ASER test in maths has includes four components namely number recognition (1 - 9), double digit number recognition (11 - 99), double digit addition (reading), subtraction, and division which is written down by the student (please see ASER Maths tools in page 141) to assess competence in basic math skills. Similarly, the language test comprised letters, words recognition, and after that paragraph I, II and story reading. The ASER tools were taken from the ASER Survey (2010) and were available on their web site. In other words, the questions were guided by the items from the ASER survey tools.

Part - D Household related information

The household questionnaire was designed mainly to collect data and information about the student's family background. It asked about students' studying, the number of children, family size, and their economic status including income and wealth.

A total of 120 households were selected from the 600 students, who attended to take the ASER test. The individual households were randomly selected from each school out of the 20 students who participated in the ASER test. Among them only 4 students were selected, equal proportions of two boys and two girls. The sample also included at least one boy and one girl from Janajati and Dalit households. This was one of the most difficult and challenging parts of the research in terms of reaching and meeting the parents in their homes particularly in the Humla and Ilam districts.

In consultation with and advice from the Head Teacher (HT) and class teachers, the researcher sent a formal message with the children in order to confirm the time of the meeting. Because of this, the parents were willing to meet and provide essential information and data for the study.

Before the start of the data collection, the researcher explained the purpose of the research study and data collection. After gaining verbal formal consent from the participants, they were willing to talk and provide the data and information required.

The research team successfully visited student's houses, and interviews were conducted to collect the data. Many parents were curious about their children's learning performance and their level. In the majority of sampled households the interviewed parents told us that they had never experienced interviews in their life time. They were quite positive and expected that this sort of exercise and research would be of benefit to their children and improve their learning level.

2.8 Pilot Test

Before finalising the survey instruments, two key steps were taken in order to make the survey instruments more reliable and effective. In the beginning a series of discussions and consultations were organised in face to face meetings with two experienced researchers. They made useful constructive remarks, critical comments and asked questions to support the development of the questionnaires.

Secondly, the research tools were piloted (i.e. the test, questionnaire and survey form) to obtain information on the following aspects: that the language was consistent and not difficult; that the time limit was appropriate, and the format was approachable. The pilot test was also to establish the reliability of the tests and ensure the adequacy of the instructions.

The piloting phase helped me to revise and make sure that the test items were valid, reliable and usable. The three achievement tests and questionnaires were piloted in the schools before the final administration. Along with the tests, the main questionnaires for school, student, teacher, and households surveys were tested. Based on the results of the piloting the test items were revised. A total of four schools (two government schools and two private schools) in Kathmandu were visited for the pilot work.

2.9 Data collection and Entry

To ensure the quality of the collected data, a number of steps were taken in order to ensure consistent, coherent and reliable data were collected. Five qualified and experienced Researcher Associates (RAs) who understood the context of schools' functioning and the learning performance of the students were recruited. The minimum qualification was a Bachelor's degree and preferably some experience in using surveys to assure good understanding of the study. A three day intensive

training session was organised by the research himself in Kathmandu in June, 2011 to enhance the quality of the field work. The RAs were given a full description and rationale for the research techniques and tips for the implementation of survey in the field. Finally, they were given an instruction sheet on ethical considerations and were asked to keep a diary of their own observations. They were required to submit a three page report stating their field experiences.

The following are the steps used in the data entry and processing. Firstly, the data entry format was designed in Microsoft Excel 2007. The format was designed to accommodate enough fields for the variables under consideration. There were ten different files for the school questionnaire. Three additional entry files were separately designed to enter the data obtained for HT and teachers, students and households. Altogether there were thirteen different files. This approach was simple to understand for all users some of whom were not used to the technical aspects of various data entry formats. Before starting the data entry, inconsistencies and errors were corrected and data were checked and assured in consultation with the RAs. The entered data were verified with a random sample of 10% entered cases. The data entered in the Excel sheet were then exported into SPSS for analysis. A separate file was also obtained for the regression analyses by merging the relevant variables from different files. Finally all data processing work was carried out using SPSS version fifteen.

This survey collected new data from public schools in Nepal. In each primary school in the sample (which has Grades I to V), data were collected relating to the learning levels of the children in Grades II and IV, using ASER type tests, individually administered to each child separately. The survey also collected basic information on the children's home background. In addition, the school survey collected information about the subject teachers (qualifications, training, years of experience) from the same primary schools where the children were tested. Finally, the school survey enabled me to collect information on the functioning of the sample schools (number of days the school was open, child enrolment, head count and attendance recorded in the register, functionality of school resources, availability of textbooks and instructional materials, library and computer).

In analyzing the obtained data the focus was on establishing key determinants associated with student performance in both Grade II and IV. Initially descriptive

statistics (mean scores, standard deviation and coefficient of variation) of the learning outcomes were calculated then regression (OLS and Logistic) procedures were employed to establish associations between input variables and outputs in terms of assessed student achievement.

2.10 Ethical issues and concerns

In utilizing this proposed method of inquiry, it is important to be aware of ethical issues. This research study was implemented using the guidelines of the British Educational Research Association (BERA). It was subject to the Institute of Education's formal process of ethical review.

Working with children:

The design included a survey instrument, and classroom work or work with children, school teams (administrator, head teacher and class teachers), and parents. With regard to testing the children, the schools were asked to administer a short maths and language test to a group of children from Grade II and IV. Full details were given to the school, and consent was obtained from the school authority. The school was asked to inform and obtain consent from the children and their parents for their participation, in line with standard school rules, procedures and regulations.

Working with adults:

Unambiguous and clearly written information in the Nepali language was provided to ensure informed consent from all participants, with the right at any time to withdraw that consent. All participants and targeted participants (for example students, head teachers, subject teachers, and parents) were provided with an explanatory sheet and their verbal consent was also recorded in field notes as well.

Participants were assured that data would be anonymised and confidentiality ensured. Any paper-data would be kept safely and after entering data on computers it would be kept securely to prevent unauthorised access. Where pictures and any kind of related papers were used, approval and consent from individuals and organizations was obtained. Furthermore, no incentive was offered to participants and no offers were made to meet any of their expenses. Amongst those expected to benefit from the research were the school-based staff who were involved, and their school.

2.11 Statistical approach on Education Production Function

In this study, continuous variables derived from ASER test scores are used as the outcome variable, as per the standard practice. Also it is assumed that there is a simple linear functional relationship between educational outcome (student achievement) and the different school resources (explanatory variables). Therefore, this research has used a single education production function in order to examine and determine the effect of school variables, family background and student characteristic variables on the achievement of the children. The regression equation predicting achievement score is generated as follows.

Where $Y = \beta + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \ldots\ldots\ldots + \varepsilon$

Where **Y** = dependent variable total achievement score

X_1, X_2, X_3 and X_4 represent four variable school, teacher, student and family related factors.

β = The intercept on achievement.

ε = This is an unabsorbed error.

This is given as shown in the equation given below in this research

Where $Yij = \beta + \beta_1 X_{1(ij)} + \beta_2 X_{2(ij)} + \beta_3 X_{3(ij)} + \beta_4 X_{4(ij)} \ldots\ldots\ldots + \varepsilon_{(ij)}$

Where,

$Y_{(ij)}$ = is the achievement level of student (i) in school (j).

β = The intercept on achievement.

$X_{1(ij)}$ = is a vector of school characteristics

$X_{2(ij)}$ = is a vector of student characteristics

$X_{3(ij)}$ = is a vector of teacher characteristics

$X_{4(ij)}$ = is a vector representing the family background of the student

$\varepsilon_{(ij)}$ = is an unabsorbed error.

The above equation explains that the test score of student i from school j can be computed as a linear combination of the four sets of determinants plus a random error term $\varepsilon_{(ij)}$ with a mean of zero. The error term is assumed to be independent. The slope coefficient vectors β_1 and β_2 capture the relationship between student outcome $Y_{(ij)}$ and $X_{1\,(ij),}$ $X_{2\,(ij)}$, $X_{3\,(ij)}$ $X_{4\,(ij)}$ respectively. For example, the elements show how much the test score changes with unit change in the levels of inputs, assuming that the other two sets of determinants remain constant.

The main problem or limitation with the above linear model is that it assumes that an additional unit of an input will have equal impact on student performance regardless of the existing level of that input. In reality, however, some of the inputs are likely to have diminishing marginal impacts on performance.

In other words, the relationship between the determinants of performance and student performance is not necessarily linear. One simple approach to introducing non-linear relationships between the outcome variable and the explanatory variables expected to demonstrate diminishing returns is to use the log of those variables in an equation.

Another problem with this linear equation is that it does not allow for interactions among the explanatory variables. For example, it assumes that the marginal impact of course completion and teaching and learning inputs are the same, regardless of the gender, ethnicity and socio-economic status of the student. This assumption might not be valid considering that while the school often provides the only learning environment for a poor child from an illiterate family, a student from a rich and educated family has a lot of input from home as well.

2.12 Statistical Method

In this thesis two separate regression models namely Logistic Regression and general Linear Regression Model or Ordinary Least Square (OLS) regression have been used based on the nature of the outcome variable. The reason for the application of the two separate regression models in spite of applying a single regression is that the nature of the outcome variable considered in this study is

different. The performance of the individual student has been measured on the basis of the ASER score. The details of the ASER score are discussed in chapter five in this thesis. The ASER score is of a dichotomous type indicating the performance of the student as either pass coded as '1' or fail coded as '0'. This dichotomous outcome variable has been used for the measurement of the performance of the student at the individual level. To explore its association with a number of school related, teacher related, and students' family related factors, a logistic regression model has been applied.

Another outcome variable is the pass percentage of the school based on the ASER score achieved by the students in each school. This outcome variable is of a continuous type and is an intervally scaled variable. Keeping in view the need to identify statistically significant factors associated with the performance of the school, a general linear regression model whose parameters are estimated by using ordinary least square (OLS) method has been carried out. This general linear regression model is also known as the OLS model. This model will be useful in identifying the number of most significant factors associated with the performance of the school which may be helpful in making future plans for the improvement of school performance.

The specification and the functional form of the Logistic regression model and the OLS regression are explained in the following sections.

2.12.1 Logistic Regression Model for Individual Level Analysis

Both theoretical and empirical considerations suggest that when the response variable is binary, the shape of the response function will frequently be curvilinear. The response functions are shaped either as a tilted S or a reverse tilted S, and are approximately linear except at the ends. These response functions are often referred to as sigmoidal. They have asymptotes at 0 and 1 and this automatically meets the constraints on E{Y} since the response function represents probabilities when the outcome variable is a 0,1 indicator variable, the mean response should be constrained as follows:

$$0 \leq E\{Y\} = \pi \leq 1 \qquad (1)$$

The tilted S shaped response functions are called *logistic response functions* and are expressed mathematically as follows in vector notation.

$$E\{Y\} = \frac{\exp(\beta' X)}{1+\exp(\beta' X)} \qquad (2)$$

Where $\beta'X = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + ... + \beta_p X_p$

$$\beta' X_i = \beta_0 + \beta_1 X_{i1} + \beta_2 X_{i2} + ... + \beta_p X_{ip}$$

A logistic response function is either monotonic increasing or decreasing depending on the sign of β_1. Another interesting property of a logistic response function is that it can be easily linearized. Let us denote E{Y} by π, since the mean response is the probability when the response variable is a 0,1 indicator variable. Then if the transformation is taken as:

$$\pi' = \log_e \left(\frac{\pi}{1 - \pi} \right) \qquad (3)$$

we can obtain from (2):

$$\pi' = (\beta' X) \qquad (4)$$

The transformation (2) is called the logit transformation of the probability π.

The ratio $\pi/(1-\pi)$ in the logit transformation is called the odds. Computing the odds is a commonly used technique of interpreting probabilities (Fleiss et al., 2003). The transformed response function (4) is referred to as the logit response function and π' is called the logit mean response and it ranges from - ∞ to ∞ as X ranges within - ∞ to ∞.

Hence, utilizing this concept of logistic response function taking on the values 1 and 0 with probabilities π and (1-π), respectively, Y is a Bernouli random variable with parameter E{Y} = π.

The logistic regression model in the usual form will be:

$$Y_i = E\{Y_i\} + \varepsilon_i$$

Since the distribution of the error term ε_i depends on the Bernoulli distribution of the response Y_i, the multiple logistic regression equation would be formulated as:

$$\pi' = \log_e\left(\frac{\pi}{1 - \pi}\right) = \beta' X \qquad (5)$$

This equation is in the same form as the multiple linear regression equation and the coefficients in the equation can be interpreted as regression coefficients. The right hand side of the equation (5) is called the linear predictor. The log of odds linked to the predictors is called the *link function* of the logistic regression.

Note that the fundamental assumption in logistic regression analysis is that log (odds) is linearly related to the independent variables. No assumptions are made regarding the distributions of the X variables (Afifi et al., 2004). One of the advantages of the logistic regression model is that the predictor variables X may be discrete or continuous.

2.12.2 Parameter Estimation in the Logistic Regression Model

Our response variable Y_i is an ordinary Bernoulli random variable where:

$$\text{Prob}(Y_i = 1) = \pi_i$$

$$\text{Prob}(Y_i = 0) = 1 - \pi_i$$

Its probability distribution can be represented by:

$$f_i(Y_i) = \pi_i^{Y_i}(1-\pi_i)^{1-Y_i}, \text{ for } Y_i = 0,1 \; ; \; i = 1,....n$$

Evidently, $f_i(1) = \pi_i$, $f_i(0) = 1- \pi_i$, and hence $f_i(Y_i)$ represents the probability that

Y_i = 1 or 0.

Since the Y_i observations are independent, their logarithm of the joint probability function will be:

$$\log_e g(Y_{1,}.....,Y_{n,}) = \log_e \prod_{i=1}^{n} \pi_i^{Y_i} (1-\pi_i)^{1-Y_i}$$

After mathematical simplification, the following estimated maximum likelihood function will be obtained:

$$\log_e L(\beta) = \sum_{i=1}^{n} Y_i(\beta' X_i) - \sum_{i=1}^{n} \log_e[1+\exp(\beta' X_i)] \qquad (6)$$

For detail about the likelihood function for logistic regression, please see Neter et al., 1996.

The maximum likelihood estimates of β' in the regression model are those values of β' that maximize the log-likelihood function (6). No closed form solution exists for the values of β' in (6) that maximize the log-likelihood function. Computer intensive numerical search like Newton-Raphson procedure, iteratively reweighted least squares etc. are therefore applied to find the maximum likelihood estimates b'.

The coefficients of these regressions indicate how changes in each of the explanatory variables is associated with the probability of passing the ASER exams assuming all other the factors remain unchanged. In other words, the beta coefficient (value of β), in a multiple logistic regression for a continuous independent variable, measures the change in the log odds of the dependent variable per one unit change in the independent variable after controlling for the confounding effects of the covariates in the model. Whereas for the categorical independent variable, the regression coefficient (beta β) for multiple logistic regression measures the difference in the log odds of the dependent variable for one level of the categorical variable with respect to the considered reference level of that categorical variable after controlling for the confounding effects of the covariates in the model under consideration.

2.12.3 Limitations of the Logistic Regression Model

In spite of the common application of logistic regression, one should be cautious in relation to issues of sample size and the nature of the data. Inadequate sample size can be a problem in logistic regression. Hosmer and Lemeshow (2000) explained in regards to the limitation of this model that the sample size needs to be large. Also the logistic regression should not be recommended to evaluate the risk factors in longitudinal studies in which the studies are of different durations (Woodbury, Manton and Stallard, 1981).

2.12.4 General Linear Regression Model for School Level Analysis

To assess the effects of different input variables such as school related variables, teacher related variables and other school facilities related variables on students' educational performance, a general linear regression model has been proposed. Educational performance refers to the pass percentage of the schools under study. This is a continuous type variable and is used as the outcome variable in this regression model assuming a linear functional relationship between the educational outcome variable and the different explanatory variables as shown below in vector notation.

$$Y = X\beta + \varepsilon \qquad (7)$$

where, Y is a vector of response or educational outcome

β is a vector of parameters

X is a matrix of explanatory variables

ε is vector of error terms with expectation $E\{\varepsilon\} = 0$ and variance covariance matrix:

$$\sigma^2(\varepsilon) = \begin{bmatrix} \sigma^2 & 0 & \dots & 0 \\ o & \sigma^2 & \dots & 0 \\ \cdot & \cdot & & \cdot \\ \cdot & \cdot & & \cdot \\ \cdot & \cdot & & \cdot \\ 0 & 0 & & \sigma^2 \end{bmatrix} = \sigma^2 I$$

Consequently, the random vector Y has expectation:

$$E\{Y\} = X\beta \qquad (8)$$

And the variance-covariance matrix of Y is the same as that of ε:

$$\sigma^2\{Y\} = \sigma^2 I \qquad (9)$$

Under the assumption of the model, any factors which are not controlled for by the included explanatory variables are incorporated in the error term. The value of β for the particular continuous explanatory variables indicates that there is an average change in the performance of the school with unit changes in the considered input variable assuming the effects of other explanatory variables remains constant. But this is interpreted in a slightly different way in the case of indicator variables. There will be (j-1) number of regression coefficients for a particular indicator explanatory variable with j levels. These regression coefficients also indicate the average changes in the performance of the school in different levels of that explanatory variable with respect to the considered reference level keeping the effects of all other explanatory variables constant.

In spite of a number of studies related to the determinants of student performance, the education literature does not provide clear guidelines regarding the functional form of the equation (Figlio, 1999). This is natural as it depends on the nature of the outcome variable. The proposed general linear multiple regression (equation-7) is equivalent to the education production function suggested by Ludger Wobmann (2003) in regards to the functional form of the model.

2.12.5 Estimation of Regression Parameters

The parameters of the general linear regression are estimated by the OLS method by minimizing Q as follows:

$$Q = \sum_{i=1}^{n} (Y_i - \beta_0 - \beta_1 X_{i1} - ..... - \beta_p X_{ip})^2 \qquad (10)$$

Now the vector of the least square estimated regression coefficients:

$$b = \begin{bmatrix} b_0 \\ b_1 \\ . \\ . \\ . \\ bp \end{bmatrix} \qquad (11)$$

The least square normal equations for the general linear regression model (7) are:

$$X'Xb = X'Y \qquad (12)$$

Now the least square estimators are:

$$b = (X'X)^{-1}(X'Y) \qquad (13)$$

The method of maximum likelihood leads to the same estimators, for normal error regression model (7) as those obtained by the method of least squares in (13). The likelihood function for general multiple regression equation is:

$$L(\beta,\sigma^2) = \frac{1}{(2\pi\sigma^2)^{n/2}} \left[- \frac{1}{2\sigma^2} \sum_{i=1}^{n} (Y_i - \beta_0 - \beta_1 X_{i1} - ..... - \beta_p X_{ip})^2 \right] \qquad (14)$$

Maximizing this likelihood function with respect to $\beta_0, \beta_1, ..., \beta_p$ leads to the estimators in (13). These estimators are least squares and maximum likelihood estimators, and are assumed to have the properties; minimum variance unbiased, consistent and sufficient.

2.12.6 Methods of Selection of Predictor Variables

As already discussed above, two regression models namely logistic regression and OLS regression models were applied to identify the significant risk factors for student performance and school performance respectively.

Univariate and multivariate regression analyses were attempted for each regression model. All possible explanatory variables are analyzed in a univariate regression analysis. Those variables which were significant ($p < 0.25$) at univariate analysis were taken as candidate variables for multivariate regression analysis.

In the second stage using all candidate variables, multivariate regression analyses were carried out at different significance levels separately i.e. at 1%, 5% and 10% levels of significance. Those variables which finally emerge as significant at the 1% level of significance in the multivariate regression model (in logistic and OLS) were assumed to be the final predictors for 1% level of significance in the multivariate regression analysis. The same approach was replicated for 5% and 10% levels of significance for the construction of the final multivariate regression model.

2.12.7 Heteroscedasticity problems, selection biases and omitted variables bias

This research recognized that a diagnostic approach using heteroscedasticity is essential to explaining to what extent and level of appropriateness the specified model fits the data used. It also indicates the power of the estimated regression coefficient in relation to the dependent variable.

The OLS regression model applied in this research to identify the most promising independent factors associated with school performance, may also have the problem of heteroscedasticity (i.e. the variance of the error term of the OLS model is not constant) as has been encountered in the application of such regression models in other scenarios. However, this research was not able to assess whether or not the heteroscedasticity problem would occur.

In such research, there might be the problem of selection bias in selecting the sampling units. In this study, a two stage random sampling procedure was adopted (For detail, please see unit 2.5 of chapter 2). Initially districts were selected and then the desired number of schools (n = 30) were selected randomly. It is hoped that this will overcome issues of selection bias.

Particularly, in this study, there is the problem of omitted variable bias because of the constraints of the data structure. In order to run the regression, every independent variable needs to one to one correspond with the outcome variable which is not just possible for each variable in this study. Therefore, some of the variables could not be incorporated into the regression model. For example; the outcome variable for school level data is school performance. The information regarding the gender of the pupil is indicated through the indicator variable (0 and 1). For any school, this cannot be one to one correspond with the school performance. Inserting the percentage of girls and boys only for that school may not be useful for running the regression model for the school performance. Therefore some variables were not included in the model.

CHAPTER - THREE
THEORETICAL FRAMEWORK

3.0 Introduction

This chapter sets out the context and theoretical framework to be used in this thesis to plan, measure and determine the learning outcomes of primary schooled age children in different geographic areas across Nepal. The proposed analytical approach considers the factors that contribute to student learning; it is also known as the educational production function framework or the input-output framework.

3.1. Human Capital Theory (HCT)

In the economics of education, education is considered to enable social changes and empowering people. However, questions remains as to whether the benefits of education are absolute or positional. At the macro level education is known to boost economic growth but at micro-level the relationship is not as simple as that; benefits for a particular person depend on what other individuals in the society are doing and on other macro-level factors such as unemployment, labour market institutions and the industrial composition of the economy.

Education plays an important role for any individual, it enhances skill, knowledge and increases the competence of the labour force, which increases productivity and efficiency of the production process. Ultimately it significantly contributes to the nations' economy. There are also many non-monetary benefits of education, such as improved health, reduced child infant mortality rates and lower crime rate all of which improve the quality of life of citizens (Lochner, 2011).

The private non-market benefits beyond earnings include contributions to better health, increased longevity, better child cognitive development, and happiness all aspects of the quality of life and of economic development. Similarly social non-market benefits beyond earning include the estimated value of their contributions to improvements in civic institutions and governments, lower crime rates, increased social cohesion, and their generation and adaptation of new ideas. (McMohan and Oketch, 2010).

Human Capital Theorists contend that for any economic growth and development to occur two requirements are necessary i.e. improvement and more efficient use of technology (because higher technology use results in greater production) and the utilisation of human resources in the employment of technology (Lucas,1988).

Skills and competencies are imparted by means of formal education and as a result, individuals will become more efficient and effective producing better outcomes (Schultz,1963). Therefore, the HCT postulates that an investment in education is an investment in the productivity of the population, which will result in the growth and development of the nation's economy (Becker,1965).

HCT was put forward and well accepted during the 1960s and 1970s; the goal of investment in education was economic development. The basic concept of HCT is that people spend money on themselves or their families in various ways, not for the sake of present employment but for future life-time returns. Human capital investment can include the acquisition of an additional level of education or training (pre-service training/in-service training) to enhance and enrich skills and competencies.

In other words, HCT recognizes that all labour inputs used in the production process do not necessarily make an equal contribution. Every individual has their own abilities, skills, experiences and competencies to perform the given task and as a result, they produce different levels of outcomes. The quality of employees can be improved by investing in them and as a result they produce higher levels of outcome.

It is expected that employers will pay different wages or salaries to employees based on their ability and the contribution they make in the production process. For instance, some workers will be paid substantially higher wages than others, perhaps because they have a higher level of education including exceptional skills and competencies and these workers will be most important and very useful to companies.

Adam Smith (1776) made important points on this topic, as he stated that, 'When any expensive machine is erected, the extraordinary work to be performed by it before it is worn out, it must be expected, will replace the capital laid out upon it, with at least the ordinary profits. A man educated at the expense of much labour and time to any of those employments which require extraordinary dexterity and skill, may be compared to one of those expensive machines'.

HTC has been explored by Schultz (1961) and clearly explained and developed in detail by Becker (1964). During the early 1960's the economist Theodore Schultz applied the concept and theory of Human Capital to reflect the value of human capacities in US economic production through what he also referred to later as the residual which could not be accounted for by traditional input factors.

HC is like any other form of capital investment. It can be invested in through education and training which will enhance and enrich employees' essential skills, knowledge and competencies and lead to an increase in productivity. As a result, a country can use its scarce resources effectively and efficiently to achieve its estimated goals and targets.

Becker (1964) suggests that education and training raise the productivity of workers by imparting useful knowledge and skills. Schultz (1975) suggests that education enhances an individuals' ability to successfully deal with disequilibria in changing economic conditions. Such ability includes that of perceiving a given disequilibrium analyzing information, and reallocating resources. Later Mincer (1974) provided an explanation that linked investment in training with workers' wages. During this time, economists began making tangible connections between education and its impact on the ability of humans to earn higher wages.

Furthermore (Becker, 1993) suggests that, in the past, economic development was largely dependent on tangible physical assets such as land, factories and equipment, where labour was one element in the production process. However, the modern economic paradigm has shifted towards nations' needs make more investment in education and health, since they are the key to improving human capital which ultimately increases the economic output of the nation.

Over the last three decades or so, more than a hundred studies have been carried out to estimate rates of return in relation to education. Most of these studies have shown that formal schooling is a crucial factor in explaining variations of salary and wages in developed countries (Cohn and Addison, 1998).

The rate of poverty reduction is a function of two variables; the overall rate of economic growth and the share of any increment in growth that is captured by the poor. Education has a bearing on both sides of the equation. Improved access to good quality learning opportunities can strengthen economic growth by raising productivity, supporting innovation and facilitating the adoption of new technology (Bourguignon, 2000).

Furthermore, HCT suggests that high economic growth and development will take place with highly skilled productive and efficient labour forces. Formal education is instrumental and necessary to improve the production capacity of a labour force. In short, “an educated population is assumed to be productive" (Fagerlind, and Saha, 2004).

The rate of return to investment in education is a measure of the future net economic payoff to an individual or to society of increasing the amount of education taken. As a measure of profitability, the rate is equivalent to the interest paid on savings or the rate of return to investing in a machine, real estate, of any other form of capital requiring a stream of investment over time and an income return over time.

Rate of return to educational investment as social and private returns are highest for primary education. The private returns exceed social returns, especially at the tertiary level. The rates of returns to investment in education are above the 10% criterion of the opportunity cost (OC) of capital and, the rates of the return are higher in less-developed countries than developed countries at a comparable level. (Psacharopoulos and Patrions*, 2004*)

Table 3-1 Results of the estimates of the return to investment in education by level

Types of returns	Primary Level of Education (as in %)	Secondary Level of Education (as in %)	Tertiary Level of Education (as in %)
Private Return	26.6	17.0	19.0
Social Return	18.9	13.1	10.8

Source: Psacharopoulos and Patrinos (2002).

The link between education and economic growth, income distribution and poverty reduction are well established. Education equips people with the knowledge and skills they need to increase income and expand opportunities for employment. This is true for household and for national economies. Level of productivity, economic growth and patterns of income distribution are intimately linked to the stage of education and the distribution of education opportunity. Increasing global economic interdependence and the growing importance of knowledge-based processes in economic growth have raised both the premium on education and associated education deficits (*EFA-GMR-2009).*

On agricultural productivity, four years of primary education increased farm productivity by an average 8.6% and that agricultural productivity was more influenced by education in modernising than in traditional environments.(Lockheed, Jamison and Lau 1980).

One study of fifty countries for 1960 to 2000 revealed that an additional year of schooling lifted average annual GDP growth by 0.37% and, when that was combined with improved cognitive skills, the figure rose to 1%. Another found that an extra year of schooling could increase individual earnings by 10% (*EFA-GMR-2009:9*).

In order to make a significant contribution to the economic growth and development of the nation, education acts as a catalytic agent. Formal education imparts the requirements and essential basic skills and knowledge to tackle newly emerging challenges and obstacle in real working life and ultimately is necessary to improve the productive capacity of the population.

Education and training are considered as a means by which the required expertise and knowledge to make a worker more productive will be updated and transferred. The worker will get a return on their investment later in life through higher wages and incentives. More resources invested in education will produce a more educated manpower, which will ultimately directly or indirectly contribute to the national economy (e.g. through taking a job, being self-employed and running businesses). Also, it will help substantially to reduce a high level of child mortality, and crime rates and will raise the standard of living in a society

Due to their up to date skills and knowledge an educated population will contribute effectively and efficiently directly to the national economy, with maximisation of production. As a result, the per unit cost will reduce and the producer can offer competitive prices in the market with a high possibility that demand may increase, so that additional revenue for the government will be generated. This revenue can be used by the government to provide more social welfare for the nation which ultimately will help to increase the quality of life of the people.

Education has long been considered a path to social and economic development and plays a crucial role in strengthening society by increasing the quantity and quality of the human capital in the economy. When education is broadly provided and reaches the poor, girls and marginalized groups, it offers the prospect that economic growth will be broadly shared. Furthermore, greater equity in education can help fuel a virtuous cycle of increased growth and accelerated poverty reduction, with benefits for the poor and for society as a whole. The eventual objective of HCT lies in economic growth at the national level and education is a worthwhile object for investment for that purpose. In other words, education is the ‘means’ or input and economic growth is the ‘end’ or outcome of development in this theory.

The economic growth and development of a nation will occur effectively and efficiently by using more advanced technology with a more highly-skilled labour force. This utilisation of competent and skilled labour forces and the employment of technology will result in competitive production.

Finally, HCT assumes that there is a strong positive correlation between investment in education and economic growth and development. An additional year of schooling or level of education will significantly contribute to productivity and help to increase the amount of income that a person can earn. In other words, a well educated and well trained labour force with wider and up to date technological and managerial knowledge, skills, and competencies will significantly contribute to the increased efficiency and productivity of an organisation. Finally, investing more in people will help to increase the economic growth of the national economy of a country.

3.2 Criticisms of Human Capital Theory (HCT)

The underlying assumptions of HCT are, firstly, that the labour markets in which the educated worker must compete are perfect ones, such that, the better educated with more skills, get the better jobs and are more productive. Secondly, it does not take account of other factors, such as motivation, job satisfaction and rewards, which might contribute to higher worker productivity irrespective of education. Thirdly, it does not consider the possibility that education only serves as a 'screening device' whereby it is not used as an indication of skills, but of other features of individuals which promote higher productivity such as appropriate attitudes, motivation and other personal characteristics (Blaug 1985; Woodhall 1895).

HCT's interpretation of education states that it enhances productivity, increases the individual's earnings and therefore represents human capital, rather than physical capital (machines) which enhance productivity. There are concerns with this interpretation: firstly, wages are used as a measure of productivity. However, labour markets are not perfectly competitive. Wages may not be determined by the market, and workers may not be paid in relation to their marginal product but rather some institutionally determined wage. For example, in many LDCs, the public sector is the dominant employer and public sector wages are typically set higher than the minimum wage.

Human Capital Theory is focused on investment in education and is seen as a single panacea for the increased efficiency and productivity of the labour force. It emphasises that, possibly, it is a single and pre-requisite factor for contribution to

the national economy. However, in the real life of the economy, there are numerous factors which are also seen essential e.g. food, housing and health. Moreover, it does not mention that a well-fed, healthy and well-housed population is more productive and efficient, both physically and psychologically.

3.3 Application of the HCT to the analysis of UPE in the Nepalese context and in this research

HCT is a viable and appropriate development approach especially for low-income countries like Nepal. Despite its criticisms, it remains an important element to consider in the development approach that, the more skilled, knowledgeable and competent people are, the more resourceful they are for societies and the country.

The concept of development in human capital theory centres largely on the economic aspect and the indicators and outcome of development is in the form of economics. As a result, it contributes to reduce the level of poverty by making a large number of people employable with acquired skills, and knowledge through education. There is a strong correlation between investment in education, quantity of employment, earning levels and economic development. Therefore sustained economic growth and poverty reduction result in more government and household resources being potentially available for education.

HCT suggests, and many people agree, that an investment in education improves the productivity of the labour force as it enhances their skills and competencies. This will help to increase their productivity and ultimately, will contribute to the national economy of the country.

Over the period of economic transfer from an agricultural to a industry and service based economy, the economy of Nepal has grown and changed considerably (the per capita income raised from $180 in 1990 to $250 in 2005/06). The income rate has increased and reached $645 in 2010/11. However, the proportion of trained, skilled and competent persons in the labour force is relatively low (20%) and the number of available skilled workers is not adequate for the expanding economic sectors, which are based on new skills and technologies (The economic survey-2011).

In Nepal, there are still a hundred thousand (4.9%) school aged children who are out-of-school. More than 65% of the population are economically active. The majority of them (84%) are in the rural areas and do not have primary levels of education with basic literacy and numeracy skills (The Economic Survey, 2012) .

The GDP of the Nepalese economy is comprised of more than 60% from services and industry sectors and the remaining 40% from agriculture. Thus significant percentages of the population are seen as being unskilled and less productive and they are not contributing as significantly to the national economy of Nepal as they could with education.

Therefore, the Government of Nepal regards achieving UPE as top of the agenda at the national level. Despite its critiques, HCT suggests that increased investment in UPE will lead to a growing national economy. Therefore, HCT is a useful framework for formulation of policy, planning and programme implementation, particularly within the primary education sub-sector.

3.4 The Production Function Approach

The production function approach focuses on establishing causal relationships between school resource inputs and school outcomes. In this approach, the school acts as a producer of education services leading naturally to the notion of the production function as used in micro-economic theory.

Even though schools are treated as ‘producers’ their main objective is not as profit earning organizations. As a result, they are viewed as organizations that should try to make best use of resources to generate better output, subject to their scarce resource constraints. The outcomes are by and large specified as some level of attainment, measured by standard test scores.

Possibly the best starting point for building a theoretical framework to analyze the determinants of students’ performance is the Coleman Report (Coleman et al. 1966). Using data from a national survey of 4,000 schools in the United States, the report challenged educators and scholars to re-evaluate the importance of school factors in determining student outcomes by concluding that a student’s family background was a far more important determinant of performance than any school factor. The multiple regression models used by Coleman et al. (1966) included three

broad categories of school factors, teacher characteristics, material facilities and curriculum, and aggregate characteristics of the ethnicity and social classes to which the students belonged. They found that variations in the chosen school-level characteristics explained only around 10% of the variance in student performance when the socio-economic characteristics of the students were taken into account. Furthermore, their analysis revealed that the overall explanatory power of these school factors depended primarily on school-level socio-economic characteristics captured by the aggregate characteristics of the classes.

Despite this, there is considerable evidence of a relationship between school resources and student achievement in terms of learning outcomes in the international literature with a multitude of studies on the determinants of student performance (Levacic and Vignoles, 2003). Different studies have tended to arrive at different conclusions depending on the theoretical framework and datasets being used.

Production functions are powerful analysis tools, which have been applied to the analysis of most forms of economic production. Since the mid-1960s, they have also been widely used in the economic analysis of education (GMR, 2005). Most of these studies utilize what is known as the production function approach, which focuses on establishing causal relationships between resource inputs and outcomes while treating other factors as confounding variables. A further point is that while achievement may be measured at discrete points in time, the educational process is cumulative; inputs applied at some time in the past affect students' current levels of achievement.

In the production function model, the dependent variable is student performance as represented by student test scores. The explanatory variables are grouped into four sets of variables namely, student inputs, family inputs, teachers' input and school inputs. Student input variables include general demographic characteristics, study habits, and the educational background of the student. Family input variables include the distance of the student's school from his/her home, demographic characteristics, economic status, the educational background of his/her family and the academic environment in his/her home. School and teacher input variables

include general school resources, learning materials and school facilities, and several teacher specific variables.

When analysing the determinants of performance test scores as the dependent variable, a linear functional relationship is assumed between educational outcomes and the explanatory variables. The empirical estimation of this relationship is performed using a multiple regression method. This research reported in this thesis employ regression analysis to produce convincing educational production function analyses.

3.5 The EPF approach used in previous research

This section discusses some of the conceptual issues in the use of production functions in education such as the specification and measure of output. It will explain some of the conceptual matters arising in the econometric analysis of education, such as the appropriateness of the use of production function analysis in education and the specification and measurement of the 'output' of and 'input[3]' into education. The final part of this chapter sets out the statistical models which were used.

Education production functions, also referred to as input-output analyses can, according to some writers, determine the relationship between various inputs into outcomes of the education process (Hanushek 1986). Kingdon (1994) also points out that 'economists and some other social scientists have approached the issue of school quality and effectiveness empirically, through the framework of educational production functions. School quality defined by school outcomes such as the achievement level of students is regressed on input into the education process such as students' characteristics, their backgrounds, peer groups, teacher and school variables'.

Not everyone accepts the production function approach. As a result, some social researchers have proposed transposing the efficiency concept implicit in production function analysis from a technical industrial setting to a social or behavioural one (Klees, 1984).

[3] Sociologists of education have also made extensive use of education production functions through they have tended to name them 'input-output' analysis.

Stephens (1990) explaining the criticism of studies that use the production function approach, especially among educational decision-makers, seems in part to be reacting against the results of these studies which show that schools are very inefficient in their use of resources.

Other researchers have questioned the rationale, in input-output analyses, of quantifying the educational process and believe that the multiple outcomes of schools cannot be simply captured in single statistics. For example, textbook availability is often used as a variable in input-output studies. However, textbook availability provides few insights into how textbooks are used in classrooms, what is retained from them and how knowledge is used (Eisemon 1988). Such critics argue for more descriptive and ethnographic research based on class-room observation.

3.6 Limitations of the Education Production function (EPF)

The production function model requires that a given set of inputs always produces exactly the same amount of output. The main difficulty with representing education as a production process is that some of its inputs and all of its outcomes are embodied in students, who have their own autonomous and distinctive behaviour.

The input to schooling processes are much less homogeneous (e.g. teachers, students backgrounds and school features) than in industry or a factory, where labour is typically assigned and performs identical tasks whereas teachers at school do not. Furthermore, the Global Monitoring Report (GMR, 2005) highlighted some constraints and issues raised by education researchers; who have become increasingly concerned that production function approaches ignore important aspects of the processes of learning and teaching in schools. These approaches tended to treat what happens in schools, the quality and nature of teacher pupil interactions, the ways resource inputs were actually used as being of little consequence.

In microeconomic theory, production functions are generally assumed to be precisely known by decision-makers and researchers involve only a few inputs that are perfectly measured and are characterised by a deterministic relationship between inputs and outputs. Additionally, it is believed that all inputs can be varied freely and independently. It has been argued that, in contrast, in the education

production function inputs are unknown (to both decision makers and researchers) and must be estimated using imperfect data; that some important inputs cannot be changed by the decision maker; and any estimates of the production function will be subject to considerable uncertainty (Hanushek,1986).

The EPF is a mathematical equation, it is assumed to be linear, additive and homothetic for all included input variables during an estimation. However, some of the educational inputs have diminishing, marginal effect and (economic scale nature in real practice in the ground) which are not captured and considered by this model, however it is also important and key factors influenced the student performance.

Card & Krueger (1996) highlighted the limitations of EPF. Researchers and professionals have frequently raised concerns and questions about outliers quality, processes and reliability of the data or other measures of student performance.

Therefore, the EPF approach does not incorporate important aspects and magnitude of school factors such as the processes of learning and teaching in school, the number, and quality of teaching learning materials and the nature of student teacher interactions, and the way resource inputs are actually used in the school system. Similarly, many other aspects of non-school factors are beyond the control of policy makers such as the economic circumstances of children, friends, innate talents, socio-cultural factors and religion.

3.7 Statistical Approach on Education Production Function

In this study, continuous variables derived from ASER test scores are used as the outcome variable, as per the standard practice. Also it is assumed that there is a simple linear functional relationship between educational outcome (student achievement) and the different school resources (explanatory variables). Therefore, this research has used a single education production function in order to examine and determine the effect of school variables, family background and student characteristic variables on the achievement of the children. The regression equation predicting achievement score is generated as follows.

Where $Y = \beta + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 \ldots\ldots\ldots + \varepsilon$

Where **Y** = dependent variable total achievement score

X_1, X_2, X_3 and X_4 represent four variable school, teacher, student and family related factors.

β = The intercept on achievement.

ε = This is an unabsorbed error.

This is given as shown in the equation given below in this research

Where $Yij = \beta + \beta_1 X_{1\,(ij)} + \beta_2 X_{2\,(ij)} + \beta_3 X_{3\,(ij)} + \beta_4 X_{4\,(ij)} \ldots\ldots\ldots + \varepsilon_{(ij)}$

Where,

$Y_{(ij)}$ = is the achievement level of student (i) in school (j).

β = The intercept on achievement.

$X_{1\,(ij)}$ = is a vector of school characteristics

$X_{2\,(ij)}$ = is a vector of student characteristics

$X_{3(ij)}$ = is a vector of teacher characteristics

$X_{4(ij)}$ = is a vector representing the family background of the student

$\varepsilon_{(ij)}$ = is an unabsorbed error.

The above equation explains that the test score of student i from school j can be computed as a linear combination of the four sets of determinants plus a random error term $\varepsilon_{(ij)}$ with a mean of zero. The error term is assumed to be independent. The slope coefficient vectors β_1 and β_2 capture the relationship between student outcome $Y_{(ij)}$ and $X_{1\,(ij)}$, $X_{2\,(ij)}$, $X_{3\,(ij)}$ $X_{4\,(ij)}$ respectively. For example, the elements show how much the test score changes with unit change in the levels of inputs, assuming that the other two sets of determinants remain constant.

The main problem or limitation with the above linear model is that it assumes that an additional unit of an input will have equal impact on student performance regardless of the existing level of that input. In reality, however, some of the inputs are likely to have diminishing marginal impacts on performance.

In other words, the relationship between the determinants of performance and student performance is not necessarily linear. One simple approach to introducing non-linear relationships between the outcome variable and the explanatory variables expected to demonstrate diminishing returns is to use the log of those variables in an equation.

Another problem with this linear equation is that it does not allow for interactions among the explanatory variables. For example, it assumes that the marginal impact of course completion and teaching and learning inputs are the same, regardless of the gender, ethnicity and socio-economic status of the student. This assumption might not be valid considering that while the school often provides the only learning environment for a poor child from an illiterate family, a student from a rich and educated family has a lot of input from home as well.

CHAPTER - FOUR
REVIEW OF LITERATURE

4.0 Background

This chapter focuses on reviewing the literature related to the research questions in this study. It considers, a number of related and relevant reports in detail in the context of the research, including access and enrolment, completion rates and quality of education in terms of learning outcomes in primary level education. It identifies what is already known in terms of key findings in these areas and also outlines where new knowledge is required and would be valuable based on the proposed research questions. The review focuses on (i) school resources and learning outcomes (ii) the determinants of pupil performance (iii) and class size debates. The final section brings up to date the theoretical and policy debates on school resources and learning outcomes in developed, developing and less developed countries. The final section includes research studies from Nepal.

4.1 Global Literature: Developed and Developing Countries

There are a number of ongoing research projects which are investigating the critical and challenging issues of school education systems across the world. This type of research can help governments restructure primary school education policy, leading to the maximum utilization of scarce resources to ensure that the educational services provided by each government support the lowest level of economic quintile learners.

Reviews of the economic literature on international differences in educational achievement have made use of international tests of educational achievement to analyze the determinants of cognitive skills. The cross-country comparative approach provides a number of unique advantages over national studies.

Despite the fact that quantitative educational input measures show little association with outputs, several measures of institutional structures and of the quality of the teaching force appear to account for significant portions of the enormous differences in student achievement.

This literature review is based on international research, from developed countries especially research from the United Kingdom (UK), and the United State (US), primarily focused on Coleman's work following studies such as Hanushek, Fuller, Krueger and Deaton and Case. International studies such as TIMSS, or SAQMEC and TEEANAGE will be discussed, then research conducted in developed and developing countries, and finally in Nepal. Examples are drawn from a number of scenarios similar to the Nepalese schooling system including some African countries and South Asian countries particularly India.

4.1.1 The determinants of pupil performance

Developed Countries

The empirical findings for this research study are reviewed and discussed below explaining the association between the various independent variables and student performance. The students' performance was measured by undertaking the standardised test and its scores considered as a dependent variables in the utilised education production function.

The best starting point for analyzing the determinants of student performance in primary school children is the Coleman Report (1966). This report was commonly presented as evidence that school resources have little effect on student achievement. Coleman's work is useful as it pits the debate around school vs home factors. Based on data from the US, home factors mattered most in pupil achievement. The research was intended to show the extent to which school achievement was related to students' ethnic and social background. The possible influence of school factors related to learning achievement was also examined. Using the data from a national survey of 600,000 students, 60,000 teachers and 4,000 schools across the US, three clusters of school characteristics were measured; (a) teacher characteristics; (b) material facilities; and (c) characteristics of the groups or classes in which the pupils were placed.

The multiple regression model used by Coleman et al. (1966) included three broad categories of school factors, teacher characteristics, material facilities and curriculum and characteristics of the classes to which the students belonged. In relation to the importance of school factors in determining student outcomes the

study concluded that a student's family background was a far more important determinant of performance that any school factors. Furthermore, it found that variations in these school-level characteristics explained only around 10% of the variance in student performance when the socio-economic characteristics of the students were taken into account.

Subsequently, other large scale studies focused primarily on providing data on equality of opportunity. These include those by Jencks et al. (1972, 1979), Alexander & Eckland (1980) and Hauser, Sewell & Alwin (1976). They concluded that there was a relatively high correlation between socio-economic and ethnic family characteristics and learning achievement and a small or even unimportant influence of school and instruction characteristics.

Coleman's research into 'Educational Opportunity' in 1966 forms the corner-stone of school effectiveness research. It is probably the single best known piece of quantitative social science research in US history. However, it has been criticised, for instance, on the limited interpretation of school characteristics and the attitudes of school head teachers and teachers towards students and integrated education, i.e. multi-racial class teaching. Other educationalists criticized the study for the rather narrow choice of school characteristics and on methodological issues (Aitkin & Longford, 1986). The only characteristic that showed a consistent relationship to academic performance was the social class of the student. Furthermore, individual academic achievement depended on a school's social composition. Students' achievement was more influenced by his/her classmates' social class, status, background, and aspirations, rather than their race.

4.1.2 Production Function Estimates

Developed countries

There is long-standing debate and controversy as to whether school resources have an association with student achievement. There are a number of research studies that have found positive effects (Hedges & Green1996; Krueger 1999), while others have found negligible or even negative affects (Hanushke 1999).

Researchers have focused on specific factors such as teacher characteristics (for example, Rivinkin, Hanushek, and Kain 2005), peer effects (Hanushek et al 2003), class-size (Angrist & Lavy 1999; Kreuger 2003) and family size (Hanushek 1992).

Hanushek (1986, 2003) based partially on an extensive review of the US literature concluded that school inputs such as teacher salaries and classroom size did not matter in relation to student test score performance. Additionally, he argued that increased school expenditure does not provide the requisite incentives within schools to improve learning outcomes. Rather, it is mainly family background in terms of parental income and education that are most important determinants of student performance. Hanushek (1979, 1986, 1997) in several reviews of the US literature concluded that 'there is no strong or consistent relationship between school resources and student performance'. However, others have criticised Hanushek's methods of selecting studies for the reviews and the interpretation of the data (Krueger, 2003).

It is noteworthy that the studies reviewed by Hanushek (1989; 1997) are primarily production function studies for developed and developing countries and often include school process factors emphasized by school effectiveness research. In recent years, there has been considerable change in school input; class sizes have reduced, qualifications of teachers have risen, and expenditure per pupil has also increased. However, there is little evidence that demonstrates that any significant change in student performance has accompanied this growth in resources devoted to schools.

He summarized more than 200 empirical studies that focused on input and output relationships that estimate the education production function in public schools in the US. He concluded that there is no consistency and an ambiguous relationship between teacher related factors and pupil learning outcomes in developed countries. The data demonstrate (see Table 4.1), that there are some positive and significant relationships compared with a considerably higher number of insignificant relationships and also negative relationships between key school input resources for developed countries and output measures. In contrast, in developing countries the data set out in Table 4.2 show that a different pattern occurs with more positive and significant relationships. There was a high proportion of insignificant

relationships with regard to teacher experience and preventable negative relationships with the key school input resources in developing countries. Similarly, analyses in less-developed countries have shown a similar inconsistency of estimated resource effects as were found in the US.

However, these studies do not incorporate the process part of education which plays a key and important role; for example the teaching learning process, the quantity and quality of instructional materials and amount of time spent in the classroom by the teacher. Therefore, this study has been criticized by some, especially on methodological grounds (Hedges and Greenwarld 1994).

Table 4-1 Findings of 376 Production Function estimates on the relationship between Student Performance and the key School Resources in Developed countries

Key School Resources	Number of estimate	Statistically Significant (%)		
		Positive	Negative	Insignificant
Teacher–Pupil Ratios (PTR)	276	14	14	72
Teacher Education	170	9	5	86
Teacher Experience	206	29	5	66
Expenditure per Pupil	163	27	7	66

Source: Hanushek (1997a)

Developing countries

In developing countries, a number of research studies on the determinants of student performance have revealed that school resources might have a stronger impact on student performance.

For example, Heyneman and Loxley (1983) analyze the data from the Second International Mathematics and Science Study (SIMSS) and concluded that the relationship between school resources and student performance was stronger in developing countries than in developed countries.

Table 4-2 also shows a more consistent pattern of relationships between school resources and outcomes compared to developed countries. It is clear that there is, nevertheless, a high level of inconsistency. The relationship was statistically insignificant in a sizeable percentage of studies. Many researchers, therefore, have

questioned the view that the relationship between school inputs and student outcomes are stronger and more consistent in developing countries.

Table 4-2 Findings of 96 Production Function estimates on the relationship between Student Performance and the key School Resources in Developing countries

Key School Resources	Number of estimate	Statistically Significant (%)		
		Positive	Negative	Insignificant
Pupil -Teacher Ratios (PTR)	30	27	27	46
Teacher Education	63	56	3	41
Teacher Experience	46	35	4	61
Expenditure per Pupil	12	50	0	50

Source: Hanushek (1995)

Fuller (1986) reviewed 72 empirical studies of student achievement worldwide and reported on which individual elements of school quality were statistically significant in explaining pupil achievement at the 5% level. Those which were significantly related to achievement in at least half of the studies were assumed to hold a 'consistent' influence on achievement.

In contrast, the study by Fuller and Clark (1994), which reviewed around 100 studies on developing countries, found a strong relationship between a number of resource variables and student outcomes. Scheern (2004) found that availability of textbooks and supplementary reading material, teacher qualities, and student time on task was consistently related to student performance.

One explanation behind the stronger impact of school resources in developing countries lies in the difference in the distribution of resources and student performance across schools. The marginal impact of school resources on student outcomes declines with the level of resources. In the case of developed countries, schools generally have such high levels of resources that increasing resources will not have any substantial impact on student performance. Whereas, developing countries typically have much lower levels of school resources. Hence, it is not surprising that the impact of additional school resources is substantially higher in these countries.

The stronger influence of school resources in developing countries is due to the difference in resource allocation and student performance regardless of school location either rural or urban. By contrast, in developed countries irrespective of geographic area almost identical resources are received by schools. Therefore, the statistical analysis is likely to demonstrate a strong association between these variables in developing countries (Scheerns, 2004). The differences in student performance are due to the effects of input variables in any production process. In general, these studies demonstrate that the estimated relationship between student outcomes and school resource variables are highly inconsistent. Furthermore, the majority of education production function studies show no statistically significant relationship between school resources and student attainment, not even a negative relationship. This applies in developed and developing countries.

Overall, these results are startlingly consistent in finding no strong evidence that teacher pupil ratio, teacher education, or teacher experience have an expected positive effect on student achievement. While the evidence from developed and developing countries shows that school resources are not closely, consistently or even weakly related to student outcomes. According to the available evidence, one cannot be confident that hiring more educated teachers or having smaller size classes will improve student performance. Teacher experience appears only marginally stronger in its relationship.

4.1.3 The class size debate

Developed countries

Over the years, there has been much debate among educationalists and economists about the effects of class size on educational performance. This debate looks set to continue, and the issue remains topical in educational reform discussions. The issue on educational inputs variables more specifically of the class size; it needs to be considered in the context of a much wider debate on school funding and who should make decisions on how education is delivered.

Examples of empirical studies with a focuses on class size in the recent past include: Glewwe et al (2004); Woessman (2003); Glewwe et al (2001); Krueger (1999), Case and Deaton (1999) and card and Krueger (1996). The main focus for most of the above studies is on the effect of class size (as a measure of school quality) on learning outcomes.

Card and Krueger (1996) summarized the results of twenty four estimates of the effect of school inputs; an OLS regression model was employed to investigate the association between the school expenditures on learning from eleven different studies. The research concluded that, all the estimate on subsequent learning, graduation rates, and years of education attainment have positive correlation. Furthermore, higher test scores do not indicate getting the well paid job and also of student's success in the labour market. It found that, there was a significant relationship between the quality of educational inputs and learning in developed countries.

Similarly in the US, Krueger (1997) used school level data with an experimental methodology. The Tennessee Student/Teacher Achievement Ratio (STAR) longitudinal study comprised 11,000 students, and their teachers from 80 schools which were randomly assigned to one of three types of classes: small classes (13-17 student), regular-size classes (22-25), and regular-size aide classes (22-25) which included a full-time teacher's aide.

The results showed that the students in small classes scored higher on standardised tests than students in regular sized classes but the findings varied across schools and student characteristics. The results indicated that the provision of a full time teacher support worker had a modest effect on student achievement. The main conclusions were that average performance on standardized tests increased by four percentile points the first year students attended small classes; the test score advantage of students in smaller classes expanded by about one percentile point per year in subsequent years; teacher aides and measured teacher characteristics had little effect and class-size had a larger effect for minority students and those having free school meals.

Overall, the study revealed significant effects of class-size on the test scores of young children (grade K-3). There were marked effects of school quality, as

measured by Pupil Teacher Ratios (PTRs), on outcomes particularly for black children. There was a strong and significant effect of PTRs on enrolment, and educational performance more specifically on test scores for numeracy.

Using school-level data for 9 and 13 year olds from the Third International Mathematics and Science Study (TIMSS) Hanushek and Luque (2003), studied the relationship between classroom average scores and a number of school and non-school factors in individual countries. Their regression results demonstrated that class-size; educational qualifications of teachers, and teacher training within the classroom had statistically insignificant relationships with classroom scores in maths in the majority of the OECD countries. Their major finding regarding developing countries in particular was that there was little support for the 'conventional view that school resources are relatively more important in less developed countries'.

Hanushek (2003) argued that there is no strong or consistent relationship between the level of school inputs (teacher pupil ratio, spending per pupil, teacher education, experience and pay) and student performance, principally measured by student test scores.

In summary, the evidence from developed countries using the education production function claims that there is no clear, systematic relationship between school resources and student performance. However, recent research into the determinants of student performance strongly indicates that teacher input for example teacher quality makes a difference and is the most significant part of difference between schools (Hanushek, 2010).

Developing countries

Studies focusing on developing countries suggest that school infrastructure is an important factor for improved learning outcomes. Parental education and parental preferences for their children have also been the focus of research on student performance with the consensus being that more educated parents are likely to send their children to higher quality schools (Case and Deaton,1999; and Glewwe and Jacoby,1994). Parental income has also been shown to influence student performance with children from well to do families having higher scores (Hanushek 2003).

Due to the problems of measuring the numerous inputs into the education process, experimental studies that control for unobserved heterogeneity (e.g. innate ability, motivation, and learning effort), have been used to study the impact of school resources on learning outcomes (Glewwe *et al.,* 2004; Duflo, 2004; Angrist *et al.*, 2002; Hoxby, 2000; Angrist and Lavy, 1999). For example, in a study investigating the effects of flip charts on test score performance in Kenya Glewwe *et al.,* (2004) found conflicting results when retrospective or randomized experimental methods were utilised.

In developing countries, Deaton and Case (1999), examined the relationship between educational inputs especially Pupil-Teacher Ratio (PTR) and school outcomes such as enrolment, grade attainment and achievement in South Africa immediately before the end of the apartheid government. Educational resources were sharply different by race, with PTRs in Black schools more than twice as high as those in White schools. This study estimated regression equations on educational attainment (by age and race) and enrolment (by age, race - black, coloured white and Asian schools) and achievement on literacy and numeracy scores (black and white).

The findings discussed above differed sharply from what was often thought to be a consensus that school resources did not matter very much. The allocations resulted in marked disparities in average class-sizes, controlling for household background variables. Deaton and Case found a strong and significant effect of PTRs on enrolment, educational attainment and achievement confined to Blacks, consistent with the view that, reductions in class-sizes that characterize education for the other racial groups had little effect.

The limitation and critiques on education production function highlighted by Card and Krueger (1996) show that test scores are inappropriate as an outcome measure, as their explanatory power is very limited, and in some circumstances that test scores do not adequately reflect school outputs. They suggest that the level of educational attainment and earnings have to be used as key outcome measures. They found a positive and statistically significant association between education resources (expenditure per pupil and pupil-teacher ratio), and educational attainment and earnings.

Wobmann (2000; 2001) also analyzed the determinants of student performance using the TIMSS data set. Despite the fact that these findings are not specific to developing countries, the general conclusion was that differences in student performance cannot be explained by differences in school resources. However, these results did reveal that the institutional features of a nation's education system had a notable impact on student outcomes.

Using school level data for 9 and 13 year aged children using the TIMSS dataset, Hanushek and Luque (2003) looked at the relationship between classroom average scores and a number of school and non-school factors in individual countries. The regression results revealed that student teacher ratio, teacher qualification, and teacher having had training had statistically insignificant relationships with classroom scores in maths in the majority of the countries.

The TIMMS study tested representative samples of students aged 13 years in 38 countries and estimated the effect of class-size on student performance in 11 countries. The education production function was estimated and using a least square regression the degree of relationship between inputs and outcomes was established. The results demonstrated that the effect of class-size on student performance was not large; however, the results for individual countries were much more diverse. Furthermore, smaller class-size had a better effect on student achievement only in countries where the average capability of the teaching force appeared to be low (Wobmann and West, 2006).

Over the years, there has been much debate among educationalists and economists about the effect of class size on educational performance. The debate looks set to continue, and the issue remains topical in educational reform discussions. The issue of class size needs to be considered in the context of a much wider debate on school funding and who should make decisions about how education is delivered. Factors such as the length of the school year and day, the numbers of classes teachers have, and the proportion of time teachers spend teaching may all contribute to the difference. Although, many people argue that smaller class sizes are both a necessary and sufficient means of achieving improved educational outcomes, there is a wide literature on other determinants of

educational quality. In comparing the evidence, it is difficult to draw firm conclusions, due to differences in methodology and the definitions used.

4.1.4 Overall summary and conclusion

The Coleman Report (1966) is perhaps the most appropriate starting point for building a theoretical framework to analyze the determinants of student performance. In developed countries, for example in the US, it found that school factors such as the teachers, schools, and fiscal resources have a minimal effect in comparison to home factors on student achievement. In contrast, subsequent studies in developing countries have found school factors to be more predominant in student achievement. For instance, Hyneman and Loxley (1986) concluded that the quality of schools and teachers does affect student outcomes in developing countries. Fuller (1986) suggested that, within industrialized countries, the effect of school quality is eclipsed by the child's' family background but that, in developing countries, school quality can be a major determinant of educational achievement because the majority of families are below the poverty line and are mostly illiterate. Hence, their familial support for children's learning at home is minimal, which forces students to rely on school classrooms, teachers, and textbooks for learning.

There is a large number of studies based on these conclusions which tried to investigate which input factors are stronger and what the major determining factors are to accomplish the required targets. That educational inputs should be important determinants of educational outcomes is a proposition that appeals to common sense, but is nevertheless controversial in the literature both for developed and developing countries.

The findings for teacher qualifications and teacher experience show that in the majority of cases, the estimated coefficients are statistically insignificant. The results are startlingly consistent in finding no strong evidence that PTRs, teacher education, or teacher experience have an expected positive effect on student achievement. Similarly, there is no strong or systematic relationship between school expenditure and student performance.

Overall, there is no convincing, decisive and consistent evidence regarding the relationship between school resources as input variables and schooling outcomes

as outcome variables in the international and national literature despite a multitude of studies on the determinants of factors associated with the outcomes of school education systems. A variety of methodological approaches have been used, and many studies have been critiqued on methodological grounds. Areas of difficulty have included sample selection and the tests used, whether national tests or specially devised standardised tests are used to measure outcomes.

Research has not indicated a close or consistent relationship between input variables and learning outcomes. In some cases huge investment has been accompanied by lower achievement. However in developing countries, there is limited empirical evidence but it does suggest a closer and more consistent relationship between resources used and children's achievement.

However, this relationship is neither significant on a consistent basis, nor does it vary systematically across countries. In the USA and most other developed countries, family background is a major determinant of academic achievement. In low-income countries the impact does not appear to be as strong.

4.2 International Standardised Tests on Student Perforomance

The quality of educational outcomes has become an international issue. As a result, quality in education has become a central topic in the policy agenda of low-income countries, donors, civil society groups and international organizations. Furthermore, the role of the state including central, provincial and local authorities in the governance of education for development has been brought into question as well as the value of new forms of education provision (Hanushek and Woessmann, 2010).

International consortia were formed in the mid-1960s to develop and implement comparisons of educational achievement across nations. This research, based on international assessment, is designed to understand the learning level of the students and also the underlying determinants of the cognitive skills of the students. The mathematics, science, and reading performance of students in many countries have been tested on multiple occasions using a common set of test questions in all participating countries. By 2010, several major international testing programmes had surveyed student performance on a regular basis. The following section describes international standardised tests are described in below.

International Standardised Tests on student performance

- **PISA-** The Program for International Student Assessment: (Testing Maths, Science and Reading performance at 15 years of age on a three year cycle since 2000).
- **TIMSS-**The Trend in International and Science Study: (Testing Maths and Science performance at Grade VIII on a four year cycle since 1995.
- **PIRLS-** The Progress in International Mathematics and Science Study : (Testing primary school reading performance on a five year cycle since 2001).
- **SACMEQ-** South and Eastern African Consortium for Monitoring Educational Quality: (Testing primary school level in learning achievement level and trends over time in reading and mathematics at Grade VI children).
- **Annual Status Education Report (ASER):** Testing to obtain a reliable estimation of the status of children's schooling and basic learning competence level in reading and arithmetic at the village and district level in India.

The Programme for International Student Assessment (PISA) is an internationally standardised assessment that was jointly developed by participating economies and administered to15-year-olds in schools in 57 countries. Four assessments have so far been carried out (in 2000, 2003, 2006 and 2009). Tests are typically administered to between 4,500 and 10,000 students in each country every three years, to assess how far students who are near the end of compulsory education have acquired some of the knowledge and skills essential for full participation in society. It estimates international education production functions that account for a rich set of family, school, and institutional determinants of student achievement at the individual, school, and country level.

Fuchs and Woessmann (2004) used the PISA student level achievement data and concluded that resources were significantly related to science achievement, smaller classes do not lead to superior student performance, but better equipment and instructional materials and better educated teachers do. Bivariate analysis showed a positive correlation between achievement and computer availability at school. Student characteristics, family background and home input were significantly related to science achievement. In particular, family background as measured by parental

education, parental occupation or the number of books at home was consistently strongly correlated to educational performance.

The TIMSS programme examines performance of a late primary, age group but only in mathematics. Woessman (2003) using the TIMSS database found that differences in the school incentive structure across countries and not differences in education resources across countries were the main determinant of student performance. The TIMSS does include some low to middle income countries but it is also beneficial for the thesis to review a wide range of literature covering developed and middle income countries even if the primary focus of the thesis is on low income countries.

4.3 Developing and Low Income countries

Studies produced for the EFA Global Monitoring Report GMR (2009) focused on 'overcoming inequality; why governance matters'. The report highlighted that in developing countries more positive links between school factors and attainment were evident. The majority of studies suggested that cognitive achievement as measured by standardised tests increased as school expenditure, teacher education and school facilities were enhanced. There was also evidence that other types of interventions, such as support for attendance, scholarship, performance-related pay for teachers and school meals, raised school attendance and achievement. The best education production functions tended to show that there was higher marginal productivity for additional educational inputs in developing countries compared to developed countries, although the outcomes of primary education in poor countries were far below those of rich countries.

Government policy and implementation capacity were important, especially for successfully determining the provision of schools and equity of access. However, there were problems for this type of research in developing countries, including weakness in the data, omitted variables, the endogenity of school quality variables, and sample bias.

Empirically based evidence and conclusions about school resources on student outcomes are very important for education policy decisions concerning expenditure on schools. International studies, namely: RECOUP, CREATE, EdQual and SACMEQ are very relevant for this review of the literature. The reason being that these studies comprise many developing and less developed countries from across the world and cover the current debates on educational issues and concerns. These research studies have had a valid, reliable and widely accepted research methodology focused on important input components such as the school, student, and family related variables.

In many developing and low income countries in Africa, and Asia, family background factors such as level of income, parental level of education, diversity of community and ethnicity have been found to be important factors in determining learning outcomes. Parents' decision making is often based upon economic conditions.

There have been several studies that have been undertaken on primary schooling, particularly on school resources and learning outcomes in these regions. There are many educational features, scenarios and phenomenon which seem quite similar in African, and South Asian countries, particularly between India, and Nepal. Many of them are focused on the role of the school in influencing attainment in developing and less developed South African countries. These studies have concluded that the inequalities which are known to exist are still largely due to the legacy of the Apartheid system. More recently, the policy focus has been on narrowing the gap between the attainment of different socioeconomic groups by addressing inequality in school resource levels and facilities.

CREATE [4] research is focused on access to basic education. Without achieving a certain level of learning, there is no fruitful meaning relating to access in education. A meaningful learning outcome is critical to long term improvement in productivity, the reduction of inter-generational cycles of poverty, the empowerment of women, and reduction in inequality. In terms of developing and framework, CREATE used

[4]CREATE: Its purpose is to undertake research designed to improve to basic education in developing countries. The Consortium for Research on Educational Access, Transitions and Equity (CREATE) is a programme of research, funded by the UK Department for International Development (DFID), with partner institutions in Bangladesh, Ghana, India, South Africa and the UK (http://www.create-rpc.org/).

the concepts of zones of exclusion to frame the analysis of access issues and also included a wide range of issues that included age of entry, age of progression, dropout; small school and multi-grade pedagogies; transition to post primary; private providers; exclusion; and supply and demand side constraints. CREATE (2007), focused on access to basic education in Ghana in order to examine access, enrolment and education policies and practices and to map out what the key challenges were to expand access, particularly for poor and marginalized groups in society. The study concluded that there was a range of interlocking supply and demand factors which influenced access to schooling. Children living in the rural north had less access than in the urban south. Accessing school at an older age, with an increased chance of dropout pulled children towards the informal labour market. Also poverty explained why girls often left the school system and remained within the home to do work there.

CREATE (2010) researched free primary education explaining the post enrolment impact, quality effects and the transition to secondary school in Kenya. The data were collected from four districts that comprised rural and urban districts namely Nyeri, and Kisii (rural) and Kajaido and Nairobi (urban). From the 17 schools sampled, school level enrolment, pupil level background and pupil level life history data were collected. At the beginning , the research examined the local level effect on free primary education 2003. Findings from the research varied widely from school to school. The research also enquired into secondary school transition patterns. While the majority of graduates from rural primary schools and from urban schools serving low-income families moved into low-status district secondary schools, graduates from urban areas were most likely to enter into higher status schools. Furthermore, access to top status national schools was largely taken by private school graduates. The existing educational provision provided equal opportunity to access the school system, but there was a huge disparity in learning outcomes. Also, there were a wide range of disparities and wide gaps between government schools and private schools in learning outcomes. There were acute shortages of teachers, physical facilities and learning materials brought about by massive enrolment which led to ‘quality shock’.

EdQual[5]: EdQual was a research programme consortium investigating educational quality in low income countries. One of the strengths of this programme was that it used comparative cross-national qualitative methods of action research and case studies. These were complemented with secondary data analysis of a large dataset on school quality, which identified indicators of quality relevant to the African context. The majority of EdQual's research is ongoing and being undertaken in the sub-Saharan region, where there are the lowest enrolment ratios and achievement rates across the world.

Tikly (2011) focused on describing the evolution of the overall approach and framework for researching education quality adopted by the Implementing Education Quality in Low-Income Countries (EdQual) Research Programme Consortium (RPC). He provides a critique of dominant approaches to researching education quality, namely human capital and rights-based approaches. The proposed framework is outlined in relation to three main pillars for explaining learning outcomes. The intersecting contexts are the policy context, the home/community context of the learner and the context of the school.

SACMEQ[6]: There are fifteen member countries of SACMEQ. The mission statement is ''to undertake integrated research and training activities that will expand opportunities for educational planners and researchers to: (a) receive training in the technical skills required to monitor, evaluate, and compare the general conditions of schooling and the quality of basic education; and (b) generate information that can be used by decision-makers to plan the quality of education".

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[5] Implementing Quality Education in Low income Countries **(EdQual**) comprises partnership with six academic institutions ,runs several research projects, mostly in Africa and works closely with teachers to develop strategies that work in their localalities and empower them as agents of change. Funded by the DFID, EdQual is generating and promoting knowledge to improve the quality of education, particularly formal basic education, for disadvantaged learners (http://www.edqual.org/).

[6] SACMEQ, (The southern and Eastern Africa Consortium for monitoring Educational Quality) is an international non-profit development organization of 15 ministries of Education in Southern and Eastern Africa that decided to work together to share experience and expertise in developing the capacities of education planners to apply scientific methods to monitor and evaluate the conditions of schooling and the quality of education, with technical assistance from UNSECO International Institute for Education Planning (http://www.sacmeq.org).

The research was carried out during 1995, 2000 and 2007 and attempted to estimate and determine the quality of education in the school education system among the seventeen member countries. The testing was developed based on a careful analysis of curricula, school syllable, and textbooks. The sampled population used for the SACMEQ I, II and III studies was the same.

Smith (2011), researching the determinants of pupil attainment in South African schools concluded that the inequalities which are known to exist in South Africa are still largely due to the legacy of the Apartheid system. Currently, the policy focus is on narrowing the gap between the attainment of different socioeconomic groups by addressing the inequality in school resource levels and facilities. Smith concluded that pupils' background school context and school resource factors determined an individual's academic attainment by developing separate multilevel models for individual learners of similar socioeconomic status. This method allowed the possibility that the different in and out of school factors combined to explain the differences in attained mathematics and reading scores of Grade 6 pupils participating in the SACMEQ II survey in 2000. Also, that outcome could be dependent on the socioeconomic status of the individual learner. Finally, it was argued that the evidence pointed to the need to additionally target deprived, mainly rural, neighbourhoods and develop interventions and alternative strategies to overcome some of the acute social disadvantages that pupils, especially from the lowest socioeconomic status, brought with them into school.

SACMEQ III (2010) focused on pupil achievement levels in reading and mathematics at Grade VI. It comprised 61,396 pupils, 8,026 teachers, and 2,779 schools. In terms of methodology, the stratification procedures adopted were explicit and implicit; each region was included by separating each sampling frame into regional lists of schools for sampling. The implicit stratification variable was 'school size' as measured by the number of Grade VI pupils completing tests at the school level.

The instruments on reading and mathematics had test items which were first arranged in order of difficulty, and then examined item-by item in order to describe the specific skills required for providing a correct response. The eight competency levels provided a concrete analysis of what pupils and teachers could actually do,

and they also suggested instructional strategies relevant to pupils who were learning at each level of competence.

The study concluded that there has been no significant improvement in the learning achievement level in primary schooling systems. Among the 17 countries, only 6 countries (Botswana, Kenya, Mauritius, Seychelles, Swaziland, and Tanzania) demonstrated high levels of achievement. They were substantially above the SACMEQ average for both reading and mathematics in both 2000 and 2007. On the other hand, 3 countries (Lesotho, Malawi, and Zambia) had much lower levels of achievement; they were substantially below the SACMEQ average for both reading and mathematics. Five countries (Lesotho, Mauritius, Namibia, Swaziland, and Tanzania) had made substantial improvements between 2000 and 2007 for both reading and maths. Regarding gender, the equality in Grade VI participation had improved in some SACMEQ countries but dealing with gender disparities in achievement was an area which showed very slow progress.

Smith (2010) conducted a study as part of SACMEQ II, which comprised a Grade VI pupil survey in 2305 schools across 14 countries in 2000. Data were collected on pupil, teachers and socioeconomic background and teachers' approaches to teaching and learning in class. The study focused on the extent to which a set of background, context and school process factors explained the unaccounted for score variation between schools in the SACMEQ six low income, large populated countries. The study concluded that having light, access to water, good quality of home structure, and access to reference books at home enhanced the scores. Furthermore, parental education (the more educated the father), the greater the positive impact. On the other hand, high levels of teacher absenteeism lowered attainment, on average. It is also interesting to note that those school led by female teachers' had higher average scores.

Oketch et. al (2010), investigated whether classroom interactions, including opportunity to learn and teacher subject knowledge explained why learning performance was so varied between schools. Six districts were sampled to ensure the proportional representation of public and private schools, twelve schools in each district were randomly sampled (six schools from the top and bottom 20%) using the Kenya Certificate of Primary Education (KCPE) results. The mean pupil scores in

mathematics was 46.9% which is below 50% (usually considered to be the pass mark). There were marked differences (23.8% points) between the top and bottom performing schools in maths mean scores. There was a linear but weaker relationship between mean score and teacher score in the bottom ranked schools, whereas in the top ranked schools the relationship was non-existent. Also, high performing schools had higher gain scores than low performing schools. The study concluded that the way teachers teach and how learners were exposed to learning opportunities contributed to a learner's achievement.

In summary, these studies (CREATE, EdQual and SACMEQ) focused on access, enrolment and the learning outcomes of the children in different contexts. Most of these studies did not focus their primary attention on families and thus did not delve very far into the measurement and structure of family contexts. The educational process is also cumulative so that both historical and contemporaneous inputs influence the current performance of the children. Common estimates rely on student performance measured by standardized tests altogether some studies use a variety of different measures including such things as continuation in school, dropout, behaviour, and subsequent labour market earnings.

4.3.1 Indian and Pakistan Context

In many developing countries including India, family background factors, such as level of income, parents level of education and ethnicity have been found to be important factors in determining learning outcomes. Parents' decision making is often based upon economic conditions. There have been several studies of primary schooling in India. Many educational features, scenarios and phenomenon are quite similar in South Asian countries particularly in India, and Nepal.

In India Jagannadhan (1986) studied a sample of 614 urban students of Grades VI and VII recorded their scores on standardised achievement tests. He divided the sample students into categories by parental characteristics and computed the mean achievement scores of pupils in different categories as well as correlation coefficients between achievement score and parental characteristics. He found that pupil achievements were systematically related with father's income, education and occupation as well as with the newspaper and magazine subscription of the household.

Govinda and Varghese (1993) found that learning outcomes were also influenced by a range of factors including quality of educational facilities, teacher attendance, socio-economic contexts, parental education, family size, attendance, household duties, nutrition and attendance at pre-school. Learning levels were very low, particularly in the rural areas and for disadvantaged ethnic minorities and scheduled castes in India. Despite gains in the access of children to schooling, a large number of ethnic minorities and especially girls still faced difficulties in attending school and continuing their studies for completion of primary level education.

Kingdon (1994), suggested that 'the overwhelming drop-out may occur partly due to the very low quality of schools which implies low economic returns to schooling. Low quality, at least in terms of school's physical facilities and teaching materials, may be due to the disproportionately large subsidies to higher education which reduce the resources available to the rest of the education sector'.

The Public Report on Basic Education (PROBE,1999), was the first serious evidence-based study of the state of primary schooling quality in India. It was based on a survey of schooling facilities in 242 villages across five north Indian states: Bihar, Madhya Pradesh, Rajasthan, Uttar Pradesh and Himachal Pradesh in 1996. It found very poor school infrastructure, e.g. 26% of schools did not have a blackboard in every classroom, 52% had no playground, 59% no drinking water, 89% no toilet, 59% no maps or charts, 75% no toys, 77% no library and 85% no musical instruments.

Kingdon, in a series of studies in India, (Dreze and Kingdon, 2001; Kingdon, 2005; 2007) showed that primary school attendance rates were considerably lower in the populous northern states of India, Bihar and Uttar Pradesh, and were unequally distributed. The learning achievement in primary schooling was very low, because of poor-quality schooling and school facilities. Inputs were low and teacher absenteeism was high. Demand and supply factors were important in explaining schooling participation. Private schools achieved significantly better academic results by relating teacher pay to achievement while government schools did not. The most likely explanation for this is that salaries proxy for teacher quality: raising wages encourages better quality candidates to apply for teaching positions, thereby raising the average quality of teachers. Current attendance rates were a more

reliable indicator of schooling participation than enrolment rates, since large enrolment rates measured at the start of the school year could mask non-attendance and /or drop-out later in the school year.

The School Teacher Effectiveness and Learning Levels (TELLS) survey (Kingdon et al 2008) visited schools four times in a year and systematically tested primary school teachers' knowledge of the subject matter that they taught. Language and arithmetic tests were especially designed to test teachers' ability to explain and teach these subjects, and their ability to spot the mistakes that the children commonly made. The survey collected data from both government and private schools, a total of 160 schools (80 schools in Bihar and 80 schools from Uttar Pradesh). The children were tested at Grade II and IV in two subjects' language (reading) and numeracy (maths). The study found, extremely low rates of school attendance among enrolled children; only 26% in Bihar and 44% in Uttar Pradesh (UP) attended school regularly. It is interesting to note that there was low attendance despite incentives (free school meals, uniforms, scholarships and textbooks). Similarly, teachers were absent more than one in five days in both states.

Learning achievement was low particularly at Grade IV (for example students who had not mastered even Grade II level basic skills enrolled at Grade VI). In terms of teacher competencies and knowledge only 28% of teachers could correctly do an area problem which is usually introduced in Grades IV and V.

Goyal (2007) also writing about India found that parents selected particular roles for their children, such as school or work or both in an attempt to optimize inadequate household resources and that this sometimes disrupted children's schooling. Furthermore, the research found that parents' or the household head's lack of education reduced the probability of attending school. Similarly, the higher the age of the head of the household, the lower the probability of children working and, conversely, the higher their probability of attending school. Analysis of the reading and mathematical scores in different behaviour settings of primary schools indicated that the scores in non-government-aided private schools for fifth grade students were better than those of public schools. The student scores in schools with higher pupil teacher ratio were lower than with lower pupil teacher ratios, the scores were

higher in schools with a greater percentage of teachers who were graduates, and the scores of general category students were higher than those of scheduled caste (SC), scheduled tribe (ST), and Other Backward Classes (OBC) categories.

4.3.2 Annual Status Education Report (ASER)

ASER is one of the largest educational surveys in the world, carried out since 2005 by PRATHAM a non-governmental organization. In terms of survey tools for primary school effectiveness in a low income country, the ASER survey is very successful. ASER is a large household survey, assesing enrolment, and learning level. It also explores trends in children's educational status over time in India. The main objectives are to provide a reliable estimation of the status of children's schooling (whether a school aged child is in school or not, what type of school) and basic learning competence in language (reading) and numeracy (arithmetic) at the village and district levels in India (sources:www.asercentre.org). The survey intends to generate a representative picture of each district.

In India, ASER (2011) showed that in language less than 30% of children could read simple words at Grade II and a year later, when tested in Grade III, about 42% of these children could do so. However, children are expected to be able to read simple words in Grade I. In maths, 75% of the sampled children were able to solve numerical one digit problems at Grade III (a level they are expected to achieve by the time they finish grade-1). However, less than 20% could solve a one digit addition word problem. In conclusion, in both subjects language and maths, there was a substantial gap between what the textbook expected and what the children could actually do.

In Pakistan, the ASER methodology was replicated by Education Watch (2011) conducting research in 19,006 households and 1,267 schools including 445 private schools in 960 villages across 32 districts (rural) in all the four provinces and Gilgit Baltistan as well as Azad Kashmir and the Islamabad capital territory. ASER (2011) found that there was poor learning achievement as only 44% children could do two digit subtraction and sums in arithmetic. Of the children attending school, some 71% attended government schools, 27% private schools and less than 2% were either attending religious schools or other education facilities. Furthermore, the learning assessment of students' ability to read Urdu and their own language showed that only 44% of class-III students could read at level-I, while nearly 80% could not read a simple

class-II story. The survey found that students' attendance at government and private schools was 85% and 89% respectively, while public sector school teachers' attendance rate was 87%.

4.4 Research in Nepal:

Nepal has made significant progress towards introducing primary education throughout the country particularly through policies to promote access. The Government of Nepal (GoN) has been increasing the share of the education budget in the total national budget (from only 9% during 1990 to almost 17% in 2011/12) in the school education sector. However, there are concerns about the quality of education. There is wide debate about how to measure quality. There is a trend to move away from input measures of quality to outcome measures of quality.

Relatively little research has been undertaken and there is a lack of rigorous analysis to date on the determinants of student performance in Nepal. The majority of the studies that have attempted to look at the relationship between school resources and school performance have relied on a very small and non-random sample of schools that are unrepresentative of the national population of schools.

Furthermore, the research has limited itself to univariate statistical tools that have enabled the researchers to look at inter-school differences with only one factor at a time. In other words, the analytical approach used did not allow for control of the influence of other factors when studying the relationship between a school resource and primary school performance. Furthermore, very little persuasive empirical evidence has been found to date in Nepal on the determinants of school performance, although children's attendance is known to impact on educational attainment and later life outcomes. Little educational social research has been conducted using student level data with wide coverage and statistical analysis which is representative.

In the past, different research institutes (government, and private), and individual researchers have undertaken several studies. Institutions and research projects such as the Research Centre for Educational Innovation and Development (CERID), the Basic Primary Education Project (BPEP), the Education Development Service Consortium (EDSC), the Primary Education Development Project (PEDP)

and the Seti Education Development Project (SEDP) have conducted studies on student achievement at different levels of school education in Nepal. The majority of these studies focused on student achievement at primary level. Such studies revealed that the mean score of primary school students in language and mathematics was less than 50%; for example, the EDSC found that the mean scores for Nepali was 45.6, 44.5 and for mathematics 43.8, and 47.0 respectively in 1997 and 2001.

To ascertain the reasons behind this and the determinants that influence achievement score in literacy (language) and numeracy (maths), is very important. Only a few studies have focused on identifying these influencing factors. ~~for~~ The relevant research is now reviewed.

CERID (1982) conducted a study on the national achievement of those who had completed primary school education. The research was titled 'Achievement Study of Primary School Children'. It focused on the achievement of primary school students in sample areas. The main objectives were to measure the level of literacy attained by those who had completed primary school. The survey tools, designed to test reading, writing and numeracy were administered to 2172 respondents and compared achievement in terms of gender, region and language spoken. This study revealed that overall mean scores were 87.8%, 68.6% and 42.5% in reading, writing and arithmetic skills respectively. Furthermore, this study concluded that boys performed better than girls. Ecologically, no significant difference was found between the performance of students living in remote and other areas. The study also identified that there was no significant difference in the performance of students based in different places of residence. However, the achievement level between Nepali and non-Nepali speakers showed a huge variation across the sampled schools. Hence, the study did not used random sampling approach so results are not representative of the national school population.

CERID (1993) conducted research on the performance of private and public school students who completed grade-V This study was limited to 20 schools (10 private and 10 public schools). In total, 200 students were randomly selected (50:50 private and public).The achievement tests were administered in Nepali, maths and social study subjects. The research revealed that mean scores in maths obtained by

private school students was 17.09 whereas it was only 8.89 for public schools. Similarly the mean scores obtained in Nepali were 40.13 and 12.89 and 29.88 and 12.52 in social studies respectively. The differences between the mean scores obtained by these two groups of students in all subjects were statistically significant. The research concluded that the performance level of private school students who completed grade-5 was considerably better than that of public school students.

New ERA (1995) conducted a survey of 126 schools in 8 districts. A univariate and multivariate regression models were adopted to analyze the data to investigate the key factors that influenced student performance and various input variables. This study concluded that school related factors such as classroom overcrowding, head teacher competency, and qualifications of the teachers were found to be associated with student performance. Furthermore, student and family related factors such as gender, parental education, regularity of school attendance, and the time spent on household work were found to be associated with student performance.

BPEP (1997) conducted research titled 'The effect of the new curriculum on the achievement of Grade IV students in Kathmandu'. The purpose of this research was to determine to what extent new curriculum materials affected student achievement. The research used various tools such as interviews, observations and a school survey questionnaire to measure the actual level of achievement. The study covered seven districts with 72 schools; 244 teachers and 128 parents were interviewed. The achievement tests were administered to 945 randomly selected students using the old maths curriculum of 1996 and to 938 students using the new curriculum of 1997. The overall achievement (the mean scores) of students based on the old curriculum was 11.54 as against 14.21 for the new curriculum. The level was significantly higher by 2.67. The study demonstrated that the new curriculum had a positive impact on Grade IV student achievement.

Joshi (1997) completed a PhD titled “Determinant of mathematics achievement of grade-10 students”[7]. The main objective of the study was to identify variables affecting maths achievement and also to determine the level of achievement. Performance was measured by the Standardised Maths Achievement Test (SMAT) which was developed and designed by CERID in 1982. It was administered to 845

[7] It was submitted to the Department of Educational Psychology, University of Alberta in 1997.

student randomly selected from 24 schools (public/private) in the Kathmandu valley. The research revealed the total mean score was 58.8 and for boys 62.1. This was found to be considerably higher than that of the girls (54.4).Student related variables, parental support, parental education pressure, parental education, and within the school environment teachers' certification, location of school, and teacher experiences were found to be significant.

BPEP (1998) studied 'The effect of the new curriculum on achievement in Grade V'. The purpose of this research was to determine the effects of new curriculum materials on the learning and achievement of students. Methodologically, this research used the prototype of the research conducted by the BPEP in 1997.

The achievement test was administered to 935 students based on the old curriculum and to 857 students based on the new curriculum at Grade V. The study revealed that the mean scores were 22.58 and 24.14 for the old and the new curriculum. Performance in maths was relatively poorer than other subjects evaluated in the same study. The post test achievement (24.14) in maths was higher than the pre-test (22.58) achievement. The above data clearly demonstrated that the new curriculum was revealed to be significantly better than achievement based on the old curriculum.

EDSC (2001), carried out considerable research on student achievement, for instance, the 'National Assessment level of Grade-V. The main objective was to find out the level of performance of Grade-V students in Nepali, Maths and Social studies and also to determine the factors contributing to students' achievement. The test was administered to 3519 randomly selected students in 143 schools representing 15 clusters. Also 408 subject teachers and 533 parents were interviewed. Both qualitative and quantitative data were used in the analysis and interpretation. The overall national achievement mean score in maths was 27.25. The performance of students from urban areas was significantly higher than rural areas. Similarly, boys were outperforming girls. Also private school performance (42.12) was considerably higher than public school performance. In this study, four key variables: school, student, teacher and parent related variables were regressed with learning. The results showed that expenditure per student, having a female teacher, economic condition, the number of times the grade was repeated, gender,

other books studied, availability of electricity, and the qualifications of teachers were the most important factors for the learning outcomes of the children.

The Nepal Joint Government-Donor Evaluation of Basic and Primary Education Programme II (2004) report is one of the most widely accepted by donor and government worker teams in Nepal. The National Assessment of Grade III and V students in 2001 and 2003 compared results in Nepali, maths and social studies. The results are presented in the below Table 4-3 below.

Table 4-3 National Assessment of Performance of Grade III and V students

Subjects/ Year	Mean Test Score (Grade III)		Mean Test Score (Grade V)	
	1997	2001	1999	2003
Nepali	45.65	44.5	51.46	55.80
Mathematics	43.81	47.0	27.25	33.33
Social Studies	50.37	63.6	41.79	61.13

Sources: Cited in the 'The Nepal Joint Government -Donor Evaluation of basic and Primary Education Programme II (2004) report'.

It described issues of quality of education, problems such as the inequalities in physical infrastructure and overcrowding in many classrooms. In terms of learning achievement level, there was no progress in the achievement level of primary level students in Nepal. At Grade III, there was a gain of about 3% (mean score from 43.81 in 1997 to 47.0 in 2001) in the achievement level of student Mathematics, whereas in language (Nepali), there was a reduction in learning outcomes (the mean score from 45.65 in 1997 and 44.5 in 2001) during the same period of time. At Grade V the data (Table 4-3) indicated that a moderate gain in performance in Nepali and maths from 1999 to 2003. Also there was a considerable gain in social studies performance.

The constraining factors identified included a very uneven pattern of quality of physical infrastructure with relatively new and reasonably equipped school blocks in use alongside older blocks with poor lighting, inadequate ventilation, no learning materials and no seating places for the students.

Despite this, Khaniya, one of the leaders of the BPEP project, suggested that the “BPEP achieved success in many of its activities” with new textbooks devised and distributed, curriculum training for teachers, and improved classroom environments for 800,000 children. Inputs improved in number and in quality.

However according to tests of Grade III children in 2003, “there is no necessary connection between investments in educational quality and improved learning outcomes” because these national assessments before and after the multiyear reform project found few differences in learning competencies. The authors questioned the appropriateness of the testing systems chosen to reflect the possible impact of the improved inputs, and the wider assumption that improved inputs lead to improved learning outcomes (Khaniya and Williams, 2004).

Concerns on Language policy and practice in Nepal school education

The constitution of the kingdom of Nepal (1990) defines languages other than Nepali as the 'languages of the nation'. Nepali, however, is defined as the 'national language'. Article 18 (1) stipulates that all communities in the country have the right to preserve and promote their languages, script and culture, a right repeated in the Interim Constitution 2007 (Article 17.3). Clause 7 of the Education Act - 7th Amendment (2001) provided a basis for mother tongue medium education in primary schools.

Joshi (2004) highlighted in his research that many developing countries are multilingual states, where it is impossible to provide education for all ethnic groups in their respective mother tongue. The practical constraints are often compounded by the concern of the authorities to strengthen national unity by providing education in a language common to all. In Nepal people's loyalty to their language has played an important role for the development of Nepal as a nation (Rana,1998a). The ethnic elites have tended towards adopting the Nepali language in their homes and in schools, taking the ruling high-caste Hindus as their role models (Gurung, 1997).

After the restoration of democracy in the country in 1990, the GON commissioned the National Education Commission (NEC) to undertake research which focussed on linguistic diversity and paved the way for change in the educational language policy in Nepal. It recommended that:

(I) In non-Nepali speaking schools, the languages of the nation (non-Nepali languages) could be employed as the Medium of Instruction (MoI).

(II) Children from multilingual communities should be encouraged to learn local languages.

(III) When recruiting teachers, priority should be given to the candidates who know the children's mother tongues.

The National Language Policy Recommendation Commission (1993) represented a milestone in proposing a number of suggestions for designing the curriculum, preparing textbooks and introducing the mother tongue as the medium of unilingual and transitional bilingual primary education.

However twenty years later many of the same points are still being made. SSRP Mid Term Report (2012) analyses language-in-education plans for Nepal with a focus on the Ministry of Education's recent mother-tongue-based multilingual education (MTB-MLE). The report suggests the following points are necessary for the effective implementation of MTB-MLE in Nepal.

- Materials in local languages should be prepared before the implementation of the program.

- Community participation and involvement of other stakeholders should be ensured at all stages of the program.

- Eight year long MTB-MLE provides a strong foundation for children's learning and helps them achieve better in all subjects including second and foreign language learning.

- Decentralised decision-making processes, with effective inspection and mentoring, helps the effective implementation of the MTB-MLE.

- Teachers' capacity to speak the mother tongue while teaching is one the most important factors for making teaching and learning of MT effective.

Overall, government policy initiatives have been underpinned by a strong commitment to language policy and practices to make equitable access, participation and learning outcomes successful in Nepal. However, to date there has been no visible policy impact and significant changes have occurred. In reality there has been underachievement and the government commitment appears to be at a rhetorical level. There is a gap between policy commitment, programme formulation and implementation in regard to these issues.

Research studies have shown that non-Nepali speakers are at a disadvantage in school education particularly indigenous peoples as demonstrated in a national achievement test at Grade V in social studies and maths where pass rates were 41.8% and 27.2% respectively. One of the main problems regarding effective and meaningful participation of ethnic and linguistic minorities related to the different language spoken and instructions being available in Nepali (EDSC 2001). CHIRAG (2001) undertook a macro study of the role of language and learning achievement, covering 12 sample districts from five development regions and three ecological belts of the country. This study focused on diagnosing the causes of difficulty in learning for non-Nepali speaking children in the public school system. The report concluded that, parents, teachers and community members should be alert, sympathetic, and co-operative in exploiting the language of instruction to foster children's learning.

4.4.1 Summary and conclusions in relation to Nepal research

Most of the Nepalese research that has been conducted on education, particularly that focusing on school resources and student achievement mainly covered the primary grades. The research has also been limited in relation to scope and in-depth analysis. Some of the research carried out focused on the evaluation of programmes and projects. There are a few studies that focused on identifying the effects of the curriculum in student achievement in subjects such as maths, Nepali and social studies. Little research has focused on factors affecting student achievement. The majority of studies were stereotyped and identical in terms of their objectives, methodologies, analysis and the survey instruments used for the achievement tests. The data were collected from students, teachers, parents and class observations. Little research applied primary achievement tests. Much

research adopted identical and frequently used secondary achievement test methods.

Most of the research carried out so far in education focused on student achievement in a limited geographical area (such as urban areas and the capital city). There has been no comprehensive research carried out, so far, focusing on primary level education based on geographic, gender, ethnicity and different economic level differences. Therefore, there is a substantial gap in these areas of research particularly in primary school children in Nepal.

In previous work there were inconsistencies and inadequate use of appropriate and updated versions of research methodology in terms of theoretical frameworks and software. Therefore, there was no in-depth analysis or any pinpointed conclusions or recommendations for the improvement of the system. Ultimately the results from the previous research have not led to an improvement in education in Nepal.

The present research is different and unique, particularly in the selection and number of key variables, the methodology and the use of statistical tools for data analysis. This research goes beyond the existing research to investigate the determining factors associated with children's learning outcomes.

Possibly, this is the first time that the ASER tool will have been used in Nepal. The ASER tools will be used to investigate the learning outcomes of the students at primary level. This research is also distinctive in terms of the statistics to be employed in analyzing the data. A nationally representative school survey including a multistage, stratified random sampling design will provide data suitable for determining complex hierarchical structures.

The research uses sophisticated statistical tools, at the first stage, for the estimation of simple descriptive statistics such as mean, median and mode, in the next stage in order to determine the causal relationships between input and outcome variables, linear and multiple regression equations. Hence, the research brings up to date the theoretical and policy level debates on school resources and student performance in Nepal. It will also add knowledge about the nature of national and international education values and goals and their mode of action.

4.5 Methodological Issues and Debates

The above review of the literature is of the various studies relating to the potential determinants of performance of various input variables (explanatory) on school resources and student performance. By analyzing the relationship between potential determinants of input variables and student performance using various datasets, these are some relevant following methodological issues and debates which are described below.

In fact, there is no conclusive evidence regarding the relationship between school resources and student performance even in the international literature despite a number of studies on the determinants of student performance (Levacic and Vignoles, 2003).

There are number of issues, concerns and debates on methodological aspects which are described in this section. The different studies reviewed tend to give different conclusions depending on thematic areas, topics, the theoretical framework and the datasets being used.

Scholars, independent researchers, research institutes and government authorities around the world are still interested and looking for a better understanding of not only the relationship between school resources and student performance, but also the overall determinants of student performance. They also are interested in measuring the magnitude (to what extent) of the regression coefficients (either positive and or negative) which predict student performance as this will in gaining in-depth explanations of student performance.

Many of the studies reviewed above, most of which deal with primary school students are relatively weak in terms of analytical approach and models. In particularly, their analyses were either based on descriptive measures and simple univariate analysis or do not adequately control for other factors when analyzing determinants of performance using multivariate analysis. The majority of the studies reviewed in this section were those that largely used the Education Production Function (EPF) approach. They mainly focused on establishing causal relationships between resource inputs and student outcomes.

The studies reviewed by Hanushek (1989; 1997) used the education production function and quite often included the school process factors, for instance instructional materials and whether or not and to what extent these have been used in the teaching learning process. Therefore, these components need to be given due consideration. Scheerens (2004), found that, there were a number of school process variables that had a consistently significant relationship with student performance. Furthermore, the effects of instructional conditions are generally larger than the effects of school resource variables in most studies. However, the data used in these studies and EPF (input - process - outcome) do not adequately capture the process which is more important in the teaching learning activities in the classroom in relation to how knowledge is produced and transferred to the student. This influences the student performance. Also, it is assumed that all input resources are being used effectively and efficiently regardless of geographic areas schools in urban or rural areas, gender, ethnicity of the students and the teaching learning process.

Coates (2003) indicated that the amount of time spent in Maths and English instruction were positive and significant predictors of performance in these subjects. However, these studies did not consider the amount of time spent in the classroom.

Card and Keurger (1996) highlighted about the limitation of EPF, in particular that it is based on mathematical expression and assumed to be linear. The magnitude and dimension of important educational input such as self satisfaction (for example joy, pleasure, social recognition),and external benefits in the society are not captured and measured by this approach. They are not considered as being important learning outcomes. Research undertaken in Nepal has attempted to look at the association between school resources and school performance. Most of the studies focused on primary level schools and students. However the analytical approach adopted in these studies have shortcomings and constraints and there are also issues relating the data in terms of quality and reliability. Moreover, these studies were small scale and not representative of the national population of school in Nepal. These studies are limited to using a univariate statistical approach to look at inter-school differences and only single factors at any one time. The analytical approach used does not allow for control of other factors when studying the relationship between school resources and school level performance. Data

problems and the use of inadequate models are often responsible for inadequate and inconsistent findings.

This research reported here is the first time undertaken in Nepal using ASER tools to measure the learning achievement in literacy and numeracy at primary level (I-V) for government and private schools based on nationally representative data for whole Nepal. This study has attempted to contribute to new knowledge through the use of statistical techniques such as multivariate OLS and multivariate logistic regression.

4.6 Overall Summary and Conclusion of this chapter

There is no conclusive evidence about the relationship between school resources and student performance, even in the international literature despite a multitude of studies on the determinants of student performance. The review of the literature has considered different studies on this topic. These studies have tended to draw different conclusions depending on the theoretical framework and datasets being used.

Most of the studies used the production function approach, which focuses on establishing a causal relationship between resource inputs and student outcomes, more specifically test scores (language and numeracy) while treating other factors as confounding variables. The large literature on the effect of school resources on student achievement has generally found ambiguous, conflicting, and quantitatively weak results or associations. Much research has suggested that an increased level of spending on educational inputs such as lower class-size or higher teacher salary has no significant effect on student achievement.

The majority of statistical estimations and summaries in the literature were unable to explain adequately the conflicting conclusions. However, some research has found persistence in a positive statistical relationship between specific school resources such as expenditure per pupil and PTRs, although allocated class-size has little effect on performance. The context and scenario is quite different between developed, developing and less-developed countries. This may account for some differences.

The conclusion is that student achievement is overwhelmingly determined by home background factors in developed as well as developing and less developed countries. Input based policies have failed to improve school effectiveness in terms of student performance. However, this does not mean that money and resources never matter or cannot matter.

Overall, these findings suggest that school resources have no causal effect on student performance, but this may be premature because studies are often confounded by a failure to isolate credible sources of exogenous variation in school-inputs. The discontinuity research design overcomes problems of confounding by exploiting exogenous variation that originates in administrative rules.

Research on primary school effectiveness in Nepal has been very limited in quantity and quality. Government data has low reliability, and there are many discrepancies in their own published and declared education data and statistics. There is widespread recognition that although school populations have risen dramatically, the country has major problems over low internal efficiency in schools. There are very large differences between enrolment, attendance and repetition rates at primary level more specifically in Grade I.

There are substantially low levels of learning outcomes at primary level across the government system. The distribution of resources to and between schools is regularly criticised in terms of class sizes, teacher attendance and teacher competence, and availability of classroom resources such as textbooks. Different outcomes for different groups, particularly disadvantaged groups, show that there are major equity problems. The current research attempts to provide a picture of the current situation and provide evidence of the key determining factors of school outcomes.

Hence, the research brings up to date theoretical and policy level debates on school resources and student performance in low-income countries. It is hoped that it also adds knowledge about the nature of the internationalization of education values and goals and their mode of action.

CHAPTER - FIVE

DATA ANALYSIS AND INTERPETATION
ACCESS TO EDUCATION

5.0 Chapter Description

The focus of this chapter is to investigate the extent of progression towards the Education for All (EFA) targets. EFA progress is measured by examining several EFA parameter indicators such as enrolment, attendance, Net Enrolment Rate (NER), Gross Enrolment Rate (GER), survival rate to Grade V and internal efficiency rates (promotion, drop-out and retention) by gender, location, caste and ethnicity at primary level.

Following this introductory section, the succeeding section provides trend analysis with regard to access, participation, equity and exclusion at primary education in Nepal. The internal efficiency of primary education is then examined with a view to assessing whether universal primary education is attainable in Nepal by 2015. The final section outlines the gap between policy commitments and educational programmes and will also explore the challenges facing Nepal in achieving EFA by 2015 in relation to equity and inclusion.

This chapter is based on published secondary information obtained from the review of documents. The review focuses on children from (5-9) years and analyzes data obtained after the EFA initiative was launched in Jomtien, Thailand in 1990. Sources of school data are (i) the Education Management Information System (EMIS) data published by the DOE/MOE, (ii) the Nepal Living Standards Survey data for 1995/96 (NLSS-I), 2003/04 (NLSS-II), and 2010/11 (NLSS-III) published by the Central Bureau of Statistics (CBS), and (iii) the Technical Review of School Education (TRSE) data published by an independent team commissioned under the provision Joint Financial Arrangement (JFA) of the EFA programme (2004-2009). It also includes analysis of recent data related specially for this thesis.

MOE/DOE publishes 'School Level Educational Statistics of Nepal' every year based on a census of all schools in the country. Data on schools, enrolment (by gender, eco-belts, ethnicity and district), teachers, NER, GER, and internal efficiency (dropouts, repetition and promotion rates) are included in the EMIS

reports. Since 2004 the DOE has published education data twice a year under the flash reporting system. Flash I takes account of school education data at the beginning of the academic year whereas Flash II reports at the end of academic year.

The Central Bureau of Statistics (CBS) conducts a survey on living standards in Nepal namely the Nepal Living Standards Survey (NLSS[8]) at regular time intervals. So far three surveys have been conducted which include data on access to schools and enrolment. The NLSS-III, conducted in 2010/11, is a follow up of the previous two rounds, NLSS-II in 2003/04 and NLSS-I in 1995/96.

An independent TRSE[9] team was commissioned and funded by Development Partners (DP) and endorsed by the government of Nepal provision under EFA. The purpose was to verify the data published by the DOE between 2005 and 2007. Furthermore, TRSE substantially covered policy level issues on school education, particularly with regard to EFA.

5.1 Status on access to primary education over the years

During the tenure of the Rana regime (1850-1950) there was only one school named 'Durbar High School' which was open only for their family and not for the general public. In the early 1950's when the country was free from 104 years of autocratic Rana rule, the basis for a modern education system was laid out. The

[8] These surveys followed a methodology developed by the World Bank and used a two-staged stratified sampling scheme to select a nationally representative sample. NLSS-I enumerated 3,373 households from 274 primary sampling units (PSUs) whereas NLSS-II was based on a survey of 3,912 households from 326 PSUs and 1,160 households from 95 panel PSUs from NLSS-I. NLSS-III enumerated 7,020 households, of which 5,988 households were from the cross-section sample and the remaining 1,032 were from the panel sample.

[9] TRSE survey used a stratified two stage random sample allocating a pre-assigned sample size of 1,000 schools (713 primary, 131 lower secondary and 156 secondary schools). In the first stage, 20 districts were sampled and in the second stage, schools were randomly identified in these sampled 20 districts. The researcher was one of the core team members and was also heavily involved in the research study.

country was then opened up to the outside world and a planned approach for development in various areas, including the education sector, began. Since then, the government has taken on a number of reforms and policy initiatives have been developed and implemented with the aim of promoting universal and equitable access, especially to primary education.

After the World Conference on education at Jomtien, Thailand in 1990, Nepal committed to achieving Universal Primary Education (UPE) by increasing access to and completion of primary education for all children. Furthermore, the government adopted the rights-based approach to education in line with international commitments related to education including the Human Rights Declaration (HRD, 1948), the Convention on the Rights of Children (CRC, 1989), the Millennium Development Goals (MDGs, 2000) and Education for All (EFA, 2000). The Interim Constitution of Nepal (2007) enshrines the right to education for all children up to secondary level with the provision of teaching basic education in the mother tongue.

Earlier reforms included the National Education System Plan (1971) and in Seti Zone the Education for Rural Development Plan programme during the 1980's. Building on the experiences of previous programmes, the country undertook planned interventions in the education sector with the introduction of projects, such as the Basic and Primary Education Project (BPEP I, 1992 - 1999), the Basic and Primary Education Program (BPEP II, 1999-2004), the Education for All Program (EFAP, 2004-2009),and the School Sector Reform Program (SSRP, 2009-2015).

Currently, the SSRP is the major reform policy initiative in school education in Nepal, which introduces the restructuring of education into basic (Grades I-VIII) and secondary (Grades IX-XII) education. It aims to achieve equitable participation of all children, ensuring quality education and developing institutional capacity at all levels. By putting forward these reform initiatives, the Program has placed emphasis on access for the out-of-school population, ensuring that there is provision for all children to learn by raising learning competencies and enhancing effectiveness in the delivery of services in the education sector.

According to the Flash Report (2011), the relevant age groups for schools are 3-4 years for ECD/pre-primary, 5-9 years for primary (Grades I-V), 10-12 years for lower secondary (Grades VI-VIII), 13-14 years for secondary (Grades IX-X) and 15-16 years for higher secondary (Grades XI-XII) education. The school year starts in the middle of April following the Bikram Sambat (Nepali Year) on the first of Baisakh.

The school education system in Nepal consists of a five-year primary school cycle, followed by three years of lower secondary, two years of secondary and two years of higher secondary education. In addition, there is provision of Early Childhood Development (ECD) and pre-primary education for children below five years across the country. While at the end of Grades V and VIII there is a district level examination, after Grade X there is a national examination called the School Leaving Certificate (SLC) examination. Similarly, there is a national level examination after grades XI and XII. Higher education is characterised by three to four years of study for a Bachelor's degree and two years post graduate study for a Master's degree followed by MPhil and PhD.

The Ministry of Education (MOE) comprises various units: the Department of Education (DOE), five Regional Education Directorates (RED) and seventy five District Education Offices (DEOs) which manage the school system from pre-primary up to Grade XII. The professional central level organizations supporting the MOE and the DOE include the National Centre for Educational Development (NCED), the Curriculum Development Centre (CDC), the Office of the Controller of Examinations (OCE), the Higher Secondary Education Board (HSEB), the Non Formal Education Centre (NFEC) and the Janak Educational Materials Centre (JEMC).

5.2 Trend Analysis of Access to Primary Education in Nepal

Enrolment indicates the proportion of school aged children in education and is used as a measuring indicator for assessing educational outcomes. It is also used in educational planning. This section maps the changing contours of access in its varying dimensions since 1990. This section presents trend analysis of access in

primary education disaggregated by gender, ecological zones[10], disadvantaged castes e. g. Dalit[11], and ethnic and linguistic minority groups e. g. Janajati[12]. Numbers of schools, enrolment (gross and net), school attendance, internal efficiency rates (promotion, repetition and dropout), survival to Grade V, and primary cycle completion rates are the key indicators used in the section. The data used also here are as published by MOE/DOE Flash Reports (I, II), TRSE reports (2005-2007), and the NLSS (I, II & III) from the various government authorities.

5.2.1 Expansion of Schools: Moving Towards Universal Primary Education

Table 5-1 reveals the trend in school expansion from the year 1951 to 2010. There has been a huge increase in the number of schools in Nepal between 1951-2010. In 1951 there were only 321 primary schools enrolling less than one percent of eligible school age children, while in 1975 there were 8,708 schools enrolling 59 percent of the children. Furthermore, by 1982 the number of primary schools rose to 9,404 (Lockheed, 1985). Now, thirty years on, the number of schools has increased fourfold to 33,160 schools. Overall, this figure demonstrates that there has been a sharp and substantial increase in the absolute number of schools between the years 1951 and 2010.

Table 5-1 Trends of Number of Schools and Students, 1951-2010

Description	1951	1971	1982	2010
Number of Schools	321	7,246	9,404	33,160
Number of students	10,000	550,000	37,00,000	47,82,885

Source: Flash Report I, 2010/2011

Schools are widespread across the country in the Mountain, Hill and Terai providing education services to all school aged children, irrespective of their gender, religion, caste and geographical location. The expansion of the school system was the result

10. Nepal has five development regions, 75 districts, 58 municipalities and 3,914 village development committees (VDCs). Ecologically, it is divided into four geographical zones – mountains, hills, Terai and valley.

11. Dalits have extremely low social status causing very low self-esteem and social alienation including untouchability. This group occupied 11 per cent in total population, 13% in 5-9 age population and 9 % in primary enrolment in 2004. 23 Dalit castes are identified by the government.

12. Janajati groups are ethnic groups having their own language, tradition and culture. These groups occupied 37% in total population, 44% in 5-9 age population and 26% in primary enrolment in 2004. 59 Janajati groups have been identified.

of informed decisions at community, district, regional and national levels and can be attributed to increased policy attention from the viewpoint of providing universal access to primary level education.

5.2.2 Types of Schools

According to Flash Report I (2011), there are mainly two types of schools: community schools (supported by the government) and institutional (private) schools (supported by parents). Community schools fall into three categories, namely community aided, community managed and community unaided. The community aided schools obtain regular central government grants in the form of teachers' salaries for approved positions, earmarked and block grants.

The unaided community schools do not receive regular government grants but get a fixed basic teacher salary and block grants. The institutional schools depend on parents' support and are managed and owned by individual or private and public trusts.

Table 5-2 reveals the trend of school distribution from the year 1990 to 2010 by level and annual growth rate. At the national level, the data indicate that there has been a substantial increase in the number of schools between the years 2005 and 2010. However, there has been a far higher increase in the average annual growth rate of lower secondary schools (4.4%) and secondary schools (6.5%) compared with the increase in primary schools (2.8%) during the period (1990-1995).

Table 5-2 Trends of Total Recorded Schools by Level and Annual Growth Rate, 1990-2010

Level	1990	1995	2000	2005	2010	Annual Growth Rate as in (%)			
						1990-1995	1995-2000	2000-2005	2005-2010
Primary	18,694	21,473	25,927	27,252	32,684	2.8	3.8	1.2	3.5
L. Secondary	4,070	5,041	7,289	8,471	11,939	4.4	7.7	1.2	7.1
Secondary	1,938	2,654	4,350	5,039	7,266	6.5	10.4	3.0	7.6

Source: Author's own calculation of Annual growth rate by using the Flash Report, School Level Educational Statistics of Nepal, 2010.

It is interesting to note that the increase in the average growth in primary schools was higher (3.8%) during 1995-2000 compared with a relatively low growth rate (2.8%) during the period 1990-1995 and (1.2%) during the period 2000-2005. The number of schools declined in this period (2005 to 2006) due to internal political instability. There could be several reasons for this. It could be that during that time the Maoist insurgency was at its peak, many schools were closed, damaged and occupied by the army and Maoist militants, particularly in the mountain and hilly regions.

Overall, there has been an increasing trend with respect to the number of schools. However, during the period 1990 to 2010 there was irregular variation with regard to the increase in the number of schools. Although the growth rate is uneven, at the national level there has been an increase in the number of schools at all levels.

The data reveal a rapid growth in primary schools from 18,694 in 1990 to 32,684 in 2010, followed by much faster growth in lower secondary (from 4,070 in 1990 to 11,939 in 2010) and secondary schools (1,938 in 1990 to 7,266 in 2010) during the same period (see Table-5.2).

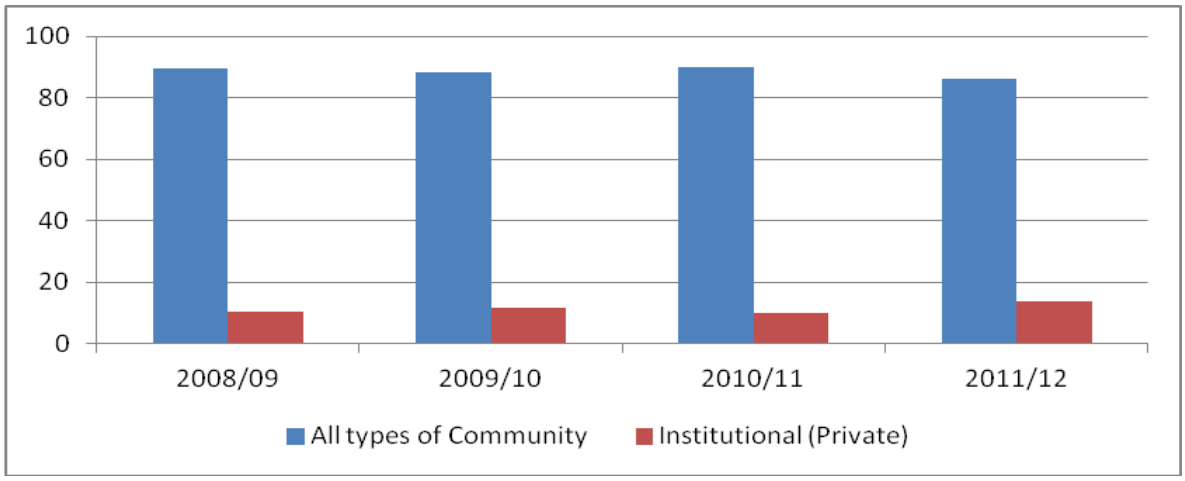
Table 5-3 and Figure 5-1 show that almost 90% of the primary school enrolment of 5-9 year old children was in community schools and the remaining 10% was in institutional schools in 2008/09. The girls' enrolment figures for private institutions were lower than in the community schools, 50% as posed to 43% in the year 2008/09 (Flash Report, 2008). This shows that if parents had to make a choice, they preferred to send their sons to private schools while they send their daughters to government schools.

Table 5-3 Share of Enrolment at Primary Level by Type of Schools 2008/09-2009/10

Type of Schools	2008/09	2009/10	2010/11	2011/12	Differences 2010-2011
All types of Community (Govt.)	89.7	88.1	90.1	86.0	- 4.1
Institutional (Private)	10.3	11.9	9.9	14.0	4.1
Total	100.0	100.0	100.0	100.0	NA

Source: Flash Report, School Level Educational Statistics of Nepal

Figure 5-1 Number of schools and Number student Enrolment in both types of schools



There could be several reasons for the disparity between government and private schools. The significant disparities in education could be due to religious and socio-cultural orthodox beliefs. Daughters are expected to get married and leave home whereas sons are expected to stay at home throughout their lives, the heir to their legacy, to take care of their parents till death. Low economic circumstances often compel parents to provide education for only one child, sons being the first priority. For this reason, statistics show that girls are far behind in their education level compared with boys, particularly in rural, poor, illiterate families, ethnic minorities and other disadvantaged groups.

The Flash Report (2009/10) showed that enrolment in government schools had decreased by 2% but the percentage of girls had increased by 1%. The total percentage of enrolment in private schools increased by 2%, however the percentage of girls' (51%) enrolment remained the same as in the previous year.

The proportion of student enrolment in government schools and private schools at primary level was 86% and 14% respectively during the school year 2011/12. When these figures are compared to the previous year's figures (90% for government schools and 10% for private schools), there was a fall of 4% in student enrolment in community schools. It is highly likely that these students have been enrolled in private schools. The number of private schools has increased, particularly in the urban and city areas across the country.

The data on community and institutional schools published by NLSS I, II and III is tabulated below. Table 5-4 shows the rising trend in the numbers of children attending private schools. It shows that while only 10% of children attended private schools in 1995/96, the figure reached 18% in 2003/04 and was still higher i.e. 28% in 2010/11. This shows the willingness of parents to send their children to private schools in their quest for quality education

Table 5-4 Trends in Type of Schools Attended by student in Schools in %

Type of Schools	1995/96	2003/04	2010/11	Differences 2010-2011
All types of Community	89.7	81.6	71.9	- 9.7
Institutional (Private)	10.3	18.4	28.1	9.7
Total	100.0	100.0	100.0	NA

Source: Nepal Living Standards Survey, 1995/96, 2003/04 and 2010/11

By comparing the data sets in Table 5-3 (FS I, 2010/11) and Table 5-4 (NLSS, 2010/11), it is possible to see that there is a substantial variation in the percentages of children attending community schools and private schools. There is a 14 percentage point difference between community and private schools in the year 2010.The reasons for such a discrepancy could be due to the methodology adopted. While the Flash Survey (FS) data is school administrative data based on school census, the NLSS data is based on household data using the survey methodology designed by the World Bank. The NLSS is conducted at particular intervals (seven years) while the FS conducts a school census every year.

The GON has shown its commitment to education by increasing the budget in the education sector. In 2012, the government allocated 18% of the national budget to the education sector. As a result the number of schools and student enrolment have been substantially increased more than ever before, particularly for girls, children from the poorest regions and low income groups. However, there are significant disparities in terms of socio-economic and geographical factors in school participation rates such as enrolment, children's attendance, NER and internal efficiency rates (promotion, drop-out and repetition rate).

5.2.3 Which children are attending private schools?

Enrolment at school varies according to wealth and the economic circumstances of the child's household. As per the NLSS data set, five categories are distinguished: poor, low class, middle class, upper middle class and richest (highest class) with each quintile comprising 20% of households.

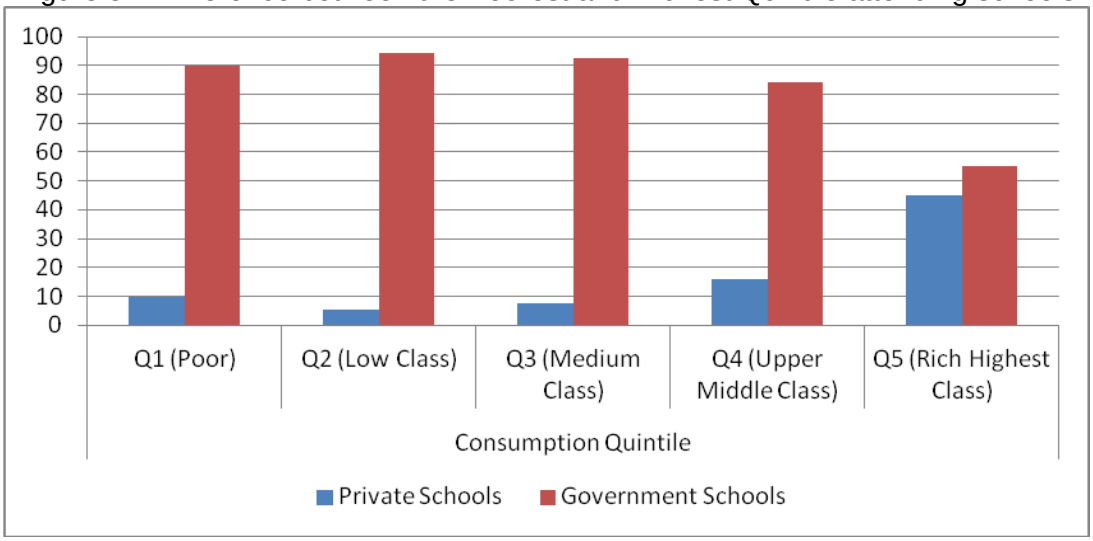
Table 5-5 and Figure 5-2 reveal the proportion of students attending private schools based on their economic circumstances. More than 90% of children from the poorest households attended community schools in 2003/04. Six years later, in 2010/11, the percentage of children from these poorest households attending community schools increased by 3 percentage points (i.e. 93% children). These data showed that in private schools, the enrolment from the lowest quintile is substantially lower compared with the richest quintile.

Table 5-5 Which children attended private schools in 2003/04

Consumption Quintile	Q1 (Poor)	Q2 (Low Class)	Q3 (Medium Class)	Q4 (Upper Middle Class)	Q5 (Rich Highest Class)	Total
Private Schools	9.9	5.5	7.4	15.8	44.9	18.4
Government Schools	90.1	94.5	92.6	84.2	55.1	81.6

Source: Nepal Living Standards Survey (NLSS), 2003/04

Figure 5-2 Difference between the Poorest and Richest Quintile attending schools



By contrast, a large number of children from the richest quintile i.e. 45% opted for private schools in 2003/04 and this trend continued increasing and reached 61% in the year 2010/11. A sharply increasing trend persists; the share of children participating in private schools reached 28 percent in 2010/11 from with 18 percent in 2003/04, large share of the students were from the richest quaintile.

Table 5-6 reveal the proportion of students attended private schools based on their economic circumstances during year 2010.2011. The participation of children from the poorest households in private schools decreased linearly to 7.3 percent in 2010/11 from 9.9 percent in 2003/04. These data clearly demonstrate that huge disparities persist between the poorest and richest quintile. The gap between these groups has consistently increased in a linear fashion.

Table 5-6 Which children attend private schools?

Consumption Quintile	Q1 (Poor)	Q2 (Low Class)	Q3 (Medium Class)	Q4 (Upper Middle Class)	Q5 (Rich Highest Class)	Total
Private Schools	7.3	13.5	20.9	35.7	61.0	28.1
Government Schools	92.7	86.5	79.1	64.3	39.0	71.9

Source: Nepal Living Standards Survey (NLSS), 2010/11

According to the NLSS III (2010/11), nearly 72 percent of the school age population attended community schools. The participation rate in private schools was at 28 percent. Among development regions, there were also large differences as the mid-West and the Far-West had much lower private school participation rates (16 percent and 17 percent respectively).

In terms of geographical location and distribution, the institutional schools are mainly situated and operating in urban city centres and well facilitated areas. Hence, community schools are the most common (more than 90%) type of school to be found in rural, mountainous and difficult areas. Therefore, the vast children of the majority of poor, deprived and disadvantaged communities are served by state schools.

The main reason for this is the ability of parents to bear the costs of education in private schools. In order to do this, parents need to raise their economic status by increasing their level of income; farming and non-farming work (business, jobs and self-employment). The government could give more extensive support to lift the economic level of those parents whose economic level is in the substantially lower quintile. The income level of households is one of the key determinant factors associated with access to education. As expected, parents of children in richer households whose income is high are also likely to be more educated and the children are more likely to be enrolled in private schools.

Looking at NLSS I, II, and III data, it is interesting to note that there is large variation between the richest and poorest quintile's nominal average per capita income. The poorest quintile's income is NRs. 2,020, NRs. 4,003 and NRs.15, 888 for the years 1995/96, 2003/04 and 2010/11 respectively. By contrast the richest quintile's income is NRs. 19,325, NRs.40, 486 and NRs. 94,149 for years 1995/96, 2003/04 and 2010/11 respectively.

These income levels clearly demonstrate that although the income level of the poorest quintile has increased, it is still very low, whereas in the richest quintile income has increased almost fourfold. The huge disparity in income illustrates why the poorest households are unable to send their children to private schools. This means that they do not have choice in the selection of schools. Therefore they are compelled to send their children to community schools. But the richest households, due to their much higher income level are able to make the choice between sending their children to private or community schools and nearly always choose private schools. They consider that sending their children to private schools will improve their children's English, along with obtaining quality education, which will open up opportunities later in life for higher education and eventually help them to get a high paying job within Nepal and abroad.

5.2.4 Which groups of children never attend school in Nepal?

As expected, children who belong to the poorest quintile are those who never have the opportunity to enrol in a school. Table 5-7 clearly demonstrates that large differences persist between the poorest and richest quintile who have never gone through the school system.

Table 5-7 Which groups of children have never attended school as in %

Consumption Quintile	Q1 (Poor)	Q2 (Low Class)	Q3 (Medium Class)	Q4 (Upper Middle Class)	Q5 (Rich Highest Class)	Total
In Percentage (%)	16.6	12.0	7.5	4.0	2.2	8.7

Source: Nepal Living Standards Survey (NLSS), 2010/11

It is noteworthy that as many as 17 percent of children, adolescents and adults from the poorest quintile of the age group 6-24 years have never attended schools compared to only 2 percent from the richest quintile. Thus there is a huge disparity between the poorest and richest quintile who have never attended school.

5.2.5 School Access and Availability: Narrowing the Gap

According to the NLSS I, II and III, universal access to primary education has been made possible by providing primary schools within a reasonable distance from where children live; by this they mean within 30 minutes travelling distance from their homes. The proportion of households having access to the nearest primary school within 30 minutes (travel time) has improved to 95% in the years 2010/11. However, the pace of development of the school system has been uneven and insufficient as children from over 5% of households, particularly in remote rural areas, are still deterred from school attendance because of the distance from the school, and also because of the difficult terrain that they have to cover in order to get there.

In the different geographical regions, almost all of the urban households (99.3 per cent) have a primary school within 30 minutes travelling time while in the rural areas it is 93.4 per cent. This percentage is the smallest for the rural eastern hills (86 percent) which is slightly lower than the percentage for the rural mid and far western hills (87 percent). Also, the richest households have a lower mean time (8 minutes)

than the poorest households to reach a similar school facility (18 minutes mean time) (see Table-5.8).

Table 5-8 Time taken to reach at Primary School in Nepal as in %

Eco-belts	Up to 30 minutes	More than 30 minutes to an hour
Mountain	92.73 %	7.27 %
Hill	91.85 %	8.15 %
Terai	97.84 %	2.16 %
Total (Nepal)	94.65 %	5.35 %

Source: Nepal Living Standards Survey (NLSS), 2010/11

This gap is significant; 90% of households in the poorest quintile have access to primary schools within half an hour distance compared to 98% for the richest households. Similarly, the mean time to reach the nearest primary school is 6 minutes in urban areas while it is 15 minutes in the rural areas.

The growth in the number of schools is an important development, but to ensure universal primary education in Nepal, the distribution of these schools needs to be within easy access for the poorest communities as well as for the rich. While formulating plans and programmes the government needs to take into account gender, ethnicity, linguistic minority, differently able children, and people from different geographical situations and in difficult circumstances in order to reach the goal of access for all.

In the present context, participation is unequal across income level and social groups. Although the availability of primary schools does not seem to be a problem, there are social and economic barriers that prevent students from attending schools which impact on access to schooling. The NLSS-III revealed that one third of children out of school were not attending school because their parents did not want them to attend. According to NLSS 2010/11, the figures were much higher for girls (38%) than boys (18%). Almost the same percentages obtained in urban and rural areas. The social factors behind a child not attending school included the responsibilities that the child had at home, which was higher for girls (22%) than boys (15%) and higher for rural (21%) than urban (16%) children. In reality, keeping school age children at home has an immediate economic benefit for the parents as

these children can fetch water, take care of younger brothers and sisters, and look after animals. This allows both parents to work as daily labourers or to work on their farm.

5.3 School Participation: Diverse Trends

In order to obtain a better understanding of the status of the current enrolment situation, it is worthwhile to identify regions which have made better progress in absolute enrolment numbers and in annual average growth rate from 1990 to 2010. To understand the issues and constraints with respect to access to and participation in primary education, it is worthwhile to explore trends and patterns of enrolment at national, eco-belt and district levels by considering gender and ethnicity factors over a period of time (Ranabhat, 2009).

Enrolment indicates the proportion of participation of school aged children in education, which is taken as one of the key measuring yardsticks for assessing educational outcomes of EFA progress. Furthermore, enrolment is also used as a tool for planning, budgeting and allocating resources in the school education system. Moreover, it is a key element both for evaluating the development of school education, and also for managing and administering it.

There are several policy initiatives and programmes that have been undertaken by the GoN to increase the enrolment of school aged children at the primary level. However, the challenge of educating children does not end with enrolment, it involves providing children with good schooling. For example, for over twenty years, the Basic and Primary Education Project (BPEP I and II, 1992-2004), EFA (2004-09) and the SSRP (2009-15) have implemented a very distinctive and popular scheme namely the 'Welcome to School' programme, under which a door to door campaign was launched to encourage parents and communities to send their children to schools. Free text books were provided for all children in primary schools. In addition, scholarships were provided to all Dalit children, children with all sorts of disabilities, fifty percent of girls and all children of the Karnali zone[13] to address the issue of vulnerability and disadvantage due to gender, income, disability and distance.

[13] There are 14 zones in Nepal including Karnali, which has 5 districts with lowest Human Development Index (HDI).

5.3.1 Enrolment Trends at Primary level

Table 5-9 set out the trends of students enrolment at primary level between 1990-2011 in millions percentages in parenthesis. At national level, enrolment by gender demonstrates that the primary level education statistics for girls increased by 14 percentage points between the years 1990 and 2010. In the year 2011, there was equal enrolment of boys and girls. Total enrolment increased from 2.79 million in 1990 to 3.26 million in 1995; ten years later enrolment figures reached 3.62 million in 2000 and finally, 4.95 million in the year 2010. In terms of absolute numbers of enrolled students, there was a rapid increase in enrolment during the period 1990 to 2010. In terms of annual growth rate, Table 5-9 clearly shows that there is an uneven annual growth rate in enrolment as illustrated in the figures of 3% (1995), 2% (2000) and 4% (2005). Primary level enrolment shows a long term average growth of 3% per annum from 1990 to 2010 (see Table 5-2).

Table 5-9 Trend of Students Enrolment at Primary Level between 1990-2011 (in millions, percentages in parenthesis)

Enrolment/Year	1990	1995	2000	2005	2010	2011
Girls	1.00 (36%)	1.30 (40%)	1.6 (44%)	2.13 (47%)	2.49 (50%)	2.41 (50%)
Boys	1.78 (64%)	1.96 (60%)	2.03 (56%)	2.37 (53%)	2.46 (50%)	2.37 (50%)
Total (in millions)	2.79 (65%)	3.26 (67.5%)	3.62 (80.4%)	4.50 (86.8%)	4.95 (94.5%)	4.78 (95.1%)
Out of school Children (in millions)	1.50 (35%)	1.57 (32.5%)	0.88 (19.6%)	0.68 (13.2%)	0.29 (5.5%)	0.25 (4.9%)

Source: Annual School Level Educational Statistics of Nepal; Flash Report 1, 2005 and 2011, Author's calculations.

The absolute number of student enrolments increased sharply between 1990 and 1995, also, there is a linear progression between the years 2000 and 2010. This indicates that there has been a marked progression in enrolment of both girls and boys during the last decades. However, in the year 2011, enrolment slightly decreased. During the school year 2011/12, the number of students fell to 4.78 million in total compared with the previous year 2010/11 (4.95 millions). In terms of

gender, girl students constituted 50% of the total enrolment, however Grade I was slightly better for girls and marginalized social groups. Therefore a similar pattern persists for both boys and girls showing gender equality in terms of enrolment.

The shortfall in enrolment may be accounted for by parents sending their children to private schools, faith-based schools (Madarashas, Gumba, Gurukul and Mission Charity schools) or perhaps even sending them abroad for their education.

Looking at district level variation, according to the Flash Survey (2012), compared to the previous year, there are 58 districts with decreased enrolment at primary level. However, 17 districts (Terai urban districts such as Saptari, Sarlahi, Sunsari and Mohatari) report increased enrolment by more than 10% at primary level. The Flash Report does not mention anything about the status of those out of school (4.9%) and their circumstances. However, in the next section, based on NLSS I, II, III findings, the reasons for not attending the school are considered.

5.3.2 Enrolment at Primary level by Gender and Social Group

Table 5-10 demonstrates the proportion of students enrolling in terms of three broad categories i.e. mainstream (upper caste and privileged group), Janajati (ethnic-minority) and Dalit (economically poor, extremely backward and treated as lower caste). The poverty indices among Dalits and Janajats are also considerably higher than other social groups.

Table 5-10 Enrolment Composition of Students by Ethnicity at Primary Level (%)

Year	Mainstream	Janajati	Dalit	Total
2004	62.2	23.0	14.8	100.0
2005	38.3	34.9	26.8	100.0
2006	47.4	35.7	16.9	100.0
2007	40.3	40.4	19.3	100.0
2008	40.4	38.6	20.0	100.0
2009	41.4	38.6	20.0	100.0
2010	40.3	38.2	21.5	100.0
2011	40.7	37.6	21.7	100.0

Source: Flash Report, School Level Educational Statistics of Nepal, 2004-2011

The proportion of Dalit in terms of enrolment of students at primary level varies from 14.8 percent to 21.5 percent during the years 2004 to 2010. In comparison to their share in the total population at around 12%, at primary level the enrolment share of Dalits was 21.7% in year 2011. The proportion of Dalits enrolled in school in the Kathmandu Valley is substantially lower (6%) as compared to other geographic regions which are at about 20%.

Table 5-10 depicts the share of Janajati students in primary education. Compared with their share in the total population at 37%, the share of enrolment in total enrolment at primary level was 38.2% in the school year 2010/11.

In terms of gender, girls constitute almost 50% of the total enrolment at the national level. The participation of girls from Dalit and Janajati groups was almost equal at the primary level (see Table 5-10).

Although the national average figure shows an improvement, the enrolment rate of Dalit and Janajati children, and the enrolment proportion of Dalit students at primary level varies widely in comparision with their share of the total population at around 12%. The primary level enrolment share of Dalits is 21.5%. It can therefore be seen that more and more Janajati and Dalit children are enrolled and attending schools which is a positive indication and shows substantial improvement in enrolment at primary school from this community.

Analyzing the above data on access to education at the national, regional, district and social group level, leads to the conclusion that the current enrolment rates are not inclusive and equitable. Similarly, there is a number of enrolment fluctuations especially at the intra-district and school levels particularly for girls in disadvantaged social groups at primary level. This is an enormous concern in terms of access, of meaningful participation and quality of education for policy makers and planners.

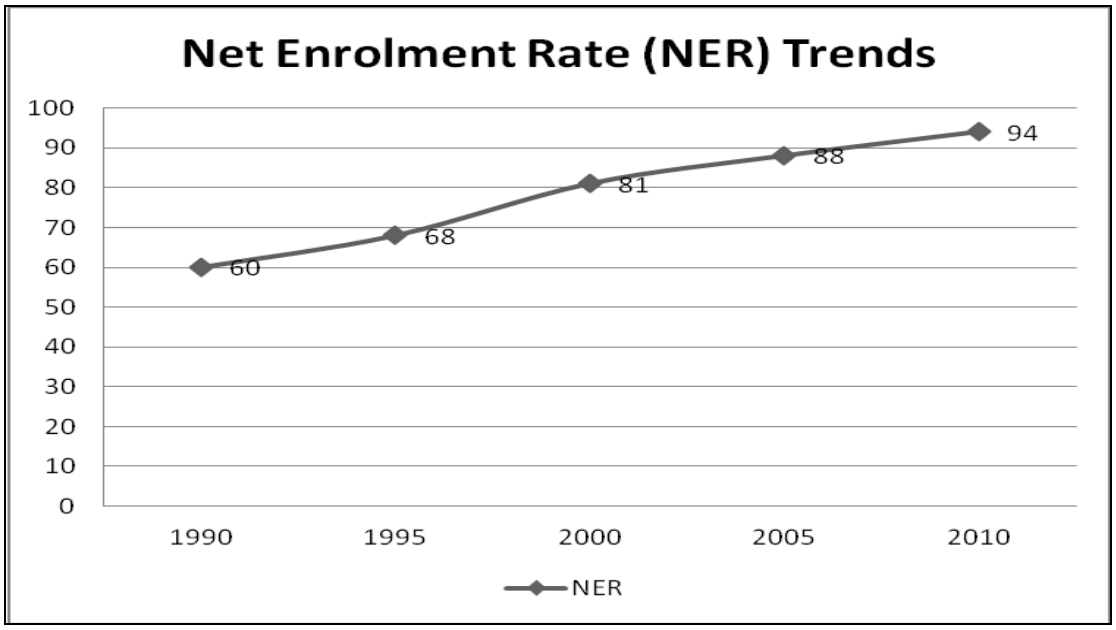
5.4 Net Enrolment Rate and Gross Enrolment Rate at Primary Level

5.4.1 Net Enrolment Rate (NER)

NER is a key educational indicator widely accepted for measuring the progress of the EFA/MDG. The GoN also uses this indicator for measuring the progress of EFA. The NER trend in primary education indicates that the correct age group (5-9 years) population seems to be in the school system at primary level.

Table 5-11 and Figure 5-3 below show the NER pattern at primary level with the annual growth rate in percentages from 1990 to 2010. The overall NER for primary level increased from 65% in 1990 to 68% in 1995, 80% in 2000, 87% in 2005 and 94.5% in 2010. It is notable that there has been a positive average annual growth rate of 3.6% over the years' 1990-2010. At the last two time points it was1.5% in the year 2000-05 and in 2005-2010 it fell further to 0.5%.

Figure 5-3 Net Enrolment Rate Trends (1990- 2010)



The overall NER for primary level increased from 65% in 1990 to 94.5% in 2010 an increase of 29.5 percentage points. Out of every 100 school aged children, only 65 were enrolled during the 1990s whereas in the year 2011, 95 students were enrolled.

The increment in NER shows a linear increase in the enrolment of the 5-9 years age group at primary level from 1990 to 2010. While boys' NER continued at a higher level than girls, there is a closing of the gender gap in enrolment ratios as measured by the Gender Parity Index (GPI), which improved to 0.98 in 2010.

Table 5-11 Net Enrolment Rate (NER) of Students by Gender, 1990-2010 as in %

Year	1990	1995	2000	2005	2010	2011	Difference 2005-2010
Girls	NA	55.6	74.6	83.4	93.6	94.5	10.2
Boys	NA	78.7	86.0	90.1	95.3	95.6	5.2
Total (%)	**60.0**	**67.5**	**80.4**	**86.8**	**94.5**	**95.1**	**7.7**
Out- of- School Children	**35.0**	**32.5**	**19.6**	**13.2**	**5.5**	**4.9**	**7.7**

Source: Flash Report 2005, 2010,and 2011 Consolidated Report of School Level Educational Statistics of Nepal, 2008 and Flash I 2011/12, Author's calculation.

The analysis shows that not only is the trend of NER in total increasing, but also the trend for the number of boys and girls enrolled has continued to be similar during the period 2000 to 2010. If the current NER average growth rate per year (approximately 2%) continues, it will be possible to achieve the EFA and MDGs target by 2015 in terms of bringing children to school. However, with respect to ensuring a quality education, minimising grade repetition, dropout, improvement of learning achievement and completion of primary education by all, it is extremely challenging.

Looking at gender, the NER for girls shows an increasing upward trend from 74.6% to 93.6% during the years 2000 to 2010. This upward trend for girls indicates that their participation in primary schooling has substantially increased to a satisfactory level. This indicates that even though progress is slow, it is in line with the targets set by EFA (2004-2009) and SSRP (2009-2015).

At national level, in 2011/12 the NER (95%) seems to be at a reasonable level. However, there is a large variance in eco-belts, development regions and at the district level. Out of 75 districts, the NER of 53 districts is above the national average (above 95%).In contrast, there are 22 districts whose NER is below the national average. Among them, there are 3 districts namely, Manang (45%) and

Mustang (84%) which are remote western mountainous districts and Saptari (84.4%) which is an urban eastern Terai district with relatively low NER.

If this trend remains static, there is a high possibility of enrolling all school aged children by 2015. However, 4.9% (approximately 0.25 million) of school children who not enrolled are a very hard core group that fall into the poorest economic quintile. They probably live in very difficult circumstances in remote areas therefore, there is little possibility of them being enrolled.

According to Flash Report I (2011/12), the present status of NER suggests that a total of approximately hundred thousand children (4.9%) are out of formal primary schooling, the majority of whom are girls. This uneven achievement in the NER clearly indicates that Nepal has a long way to go to achieve the EFA targets by 2015.

These NER growth rate figures suggest that it might be possible to reach 100% NER by 2015. However, the challenges are enormous to bring its hard core group of children of the poorest of the poor households from disadvantaged communities particularly girls into school. Therefore, due to fact that there are huge disparities and differences found in gender, ethnicity, and geographical access to education, it is not currently equitable and inclusive at the primary level.

5.4.2 Gross Enrolment Rate (GER)

Table 5-12 shows the GER pattern at primary level with annual growth rate in percentage from 1990 to 2011. The increment in GER shows the enrolment of over and under age children at primary level from 107.5% in 1990 to 139.5% in 2010. From 1990 to 2010, the GER increased by almost 23% with an average annual growth rate gain of almost 6%. During the year 2011, the GER fell to 135.9% from 139.5% in the previous year.

Table 5-12 Gross Enrolment Rate (GER) of the Student by Gender as in %

Year	1990	1995	2000	2005	2010	2011	Difference 2005 -2010
Girls	81.3	94.2	108.4	141.8	144.8	141.2	3.0
Boys	131.3	132.7	130,6	148.8	134.5	131.0	- 14.3
Total	**107.5**	**114.1**	**119.8**	**145.4**	**139.5**	**135.9**	**- 5.9**

Source: Flash Report 2005 and 2010, School Level Educational Statistics of Nepal, 2008

The Gross and Net Enrolment Rates have substantially increased in primary education in recent years. Government interventions such as the 'Enrolment Campaign', 'Welcome to School Programme', 'Per Child Funds (PCF)' and various scholarship schemes focusing on the different disadvantaged groups of children have contributed to increased enrolment.

According to Flash Report I (2011), the district level analysis shows that compared to the national average, there are 42 districts with a low GER at primary level and the remaining 33 districts (mostly Hill districts) have high GER rates at primary level. Similarly, there were wide disparities found in the development regions, for example the GER is highest in Mid-Western Mountain (200.8%) and lowest in Western Mountain (109.8%).

There could be several reasons for this, however the Flash Report does not explain these. However, the high number of GER clearly indicates that there are substantial numbers of children at primary school who are under-and-over aged at the time of enrolment in the primary school for formal education. For various reasons, these under and over aged children may not continue throughout the primary education cycle, contributing to high drop- out rates and grade repetitions in the school system at primary level. On the other hand, when NER is as high as over 95 percent, it is assumed that it should impact upon GER, reducing it to a reasonable level.

Overall, the magnitude and trends for these measures of 'internal efficiency' were largely identical for boys and girls across Grades I-V between 2005 and 2010. However, differences between girls and boys are more significant between the years 1990-2005.

However, the size of these gains when compared with the larger increases in NERs would suggest that improvements in access could be mainly representative of new children brought into the system.

In summary, Nepal has made remarkable progress, particularly in enhancing universal access to primary education at the national level, for example the NER was at 94.5 percent (girls 93.6 percent and boys 95.3 percent) in 2012 (DOE, 2012) from NER at 67.5 percent (girls 55.6 percent and boys 78.7 percent) in 1995. At a national level, the NER figures seem satisfactory. However, the NER achievement shows significant variation at the district level and between the different socio-economic groups, particularly for ethnic minorities. There are many children who are still out of the formal school system.

The planners face multiple challenges to bring out-of-school children from the poorest households and disadvantaged communities into the school system. With less than three years to the target date of 2015, it will be extremely difficult to reach the stated targets of EFA.

5.5 Attendance of Students at Primary Level

Student attendance is a very important indicator in a school system. This indicator assesses the regularity of the students' presence and how schools operate and also points out whether or not children have appropriates time for learning. It is expected that children who are regularly present in school are highly likely to learn more than those who are not. In this regard, the Flash census data presents the status of students' attendance on three different dates within the school year 2008/09 and 2010/11. These data are depicted in Table 5-13.

Table 5-13 shows student attendance on three different dates i.e. in May, September and February every year. The grade and level of average attendance is calculated by taking the total number of students in each grade attending on the particular date and comparing it with the total number of students in that grade at the beginning of the school year.

Table 5-13 Composition of the average attendance rates of students by grade and level, 2008/09 and 2010/11

Grade	Percentage of attendance		Percentage difference
	2008/09	2010/11	
One	70.3	73.8	3.5
Two	75.9	76.6	0.7
Three	77.2	78.7	1.5
Four	77.6	79.3	1.7
Five	79.1	80.6	1.5
Primary Level	75.1	77.2	2.1

Sources: Flash Report 2008/09 and 2010/11, Author Calculation

The overall average attendance rates for all three dates were 75.1%, 79.6% and 80.3% at primary, lower secondary and secondary level respectively in the year 2008/09. According to the data, the national average attendance rate for primary level in 2011 was 77.2%. The attendance rate is somewhat lower for Grade I (73.8%) compared with Grade V (80.6%), almost a 6.8 percentage point difference at the national level. The student attendance rate increased with each grade. These data clearly indicate that the higher the grade, the higher the attendance at primary level irrespective of gender.

At primary level (I-V), the data imply that nearly 25% of children were not attending their class on the reference date and thus were not engaged in formal learning. The data also reveal that there were more absentees in Grade I (30%) compared to Grade V (21%), with almost a 9% difference at the national level. This means that when children are promoted to Grade II, they tend to continue to the higher grades. This might be due to their maturation and awareness of their educational progress.

The attendance rate at Grade I is significantly lower compared to other higher grades in primary education. Likewise, the analysis of students' attendance rates on three different dates indicates that attendance is almost the same. On average, almost 30% students are not regularly attending the daily teaching and learning activities in the classroom.

By the year 2010/11, there had been a slight improvement in the attendance rate by two percentage points as compared to 2008/09. According to Flash Report I (2011), the relatively low attendance rates might be a significant contributing factor to the low rates of retention and the low percentage of students appearing in the final examination. In addition, the low attendance rates might affect overall internal efficiency (more than 22.6% repetition rate in Grade I in the school year 2010/11) of the overall education system.

Overall, the percentage attendance rate shows linear progression through the grades. The higher the attendance rate the higher the promotion rate which leads to lower grade repetition and dropout rates. More specifically, attendance in Grade I is low despite having the highest number of enrolled students in comparison to all grades at primary level (I-V). For every 100 enrolled students, 23 have not attended the school. This Flash Report does not say anything about the cause of absenteeism. Since the absentee children have missed class activities, they are less likely to understand all of the lessons which in turn will negatively affect their academic attainment. Due to low achievement, they may become de-motivated resulting in more absences from class.

5.5.1 Evidence from Technical Review of School Education (TRSE)

According to the TRSE (2006), there was large variation and discrepancy in the attendance rate at district and school level. At the district level, the highest attendance rate was in the Far-West hill district (Dailekh) with 86% whereas the lowest was in the far-east district (Panchthar) with only a 54% attendance rate. In terms of geographical eco-belts, the attendance rate was lowest in the Terai with 59% whereas the highest was in the capital city Kathmandu valley with more than 90%.

In terms of social groups, the attendance rate of Dalit students was low (51%), 17% lower than the national average. Only 28% of Dalit students had an attendance rate of more than 90% This shows a wide gap between the highest and the lowest attendance rates at primary school in Nepal.

Moreover, many districts had high attendance rates for Dalit girls, demonstrating that once girls are enrolled, they tend to continue their education and complete the primary education cycle. Interestingly, in all geographical eco-belts, attendance rates are in favour of Dalit girls. Dalit girls seems to be more committed to learning than Dalit boys.

Similarly, the attendance rate for Janajati children was only 61%, which is 7% lower than the national average and 10% higher than for the Dalit students. At the district level, the highest attendance rate for Janajati was almost 95% in the Kathmandu valley (capital city) whereas the lowest was in the Terai districts, such as in the Nawalparasi district (urban Terai district) where it was only 38%.

The TRSE report concluded that those children from more difficult areas (remote), poor and ethnic minority groups had a substantially lower rate of attendance. There could be several reasons for the high level of variation in attendance, such as the structure of society and its values, norms and beliefs, where gender biases influence parents' decision regarding school attendance. Most of the parents who are poor, and particularly those from ethnic minority families, make choices in favour of boys to provide education. Due to cultural and religious factors, they believe the son has sole responsibility for the family throughout their life whereas daughters go to their husbands' home after marriage.

In conclusion, the data and report published by the government - Flash Report (I, II), NLSS (I, II & III) and the independent study TRSE on school recorded attendance and head count numbers depict different figures. The FR-I figures in particular are quite high and inconsistent. The researcher's own experiences and observations in attending on many occasions regular meeting with ministry officials, mid-term reviews and final evaluation of projects have shown that the Development Partners (DPs) have raised questions on the reliability and validity of the data.

During 2005/07 an independent team was formulated by DPs endorsed by the Ministry of Education to verify the FR produced data. They asked questions about methodology, the quality of data collection and reporting. The DPs raised questions to the government authority based on NLSS, TRSE and many other independent study reports.

The reasons for such discrepancies could be due to the methodology. The Flash Reports (I,II) data set is a census methodology to capture all government schools' information via the government system whereas the NLSS data analysis is World Bank designed, a random two stage stratified larger scale household level survey. The TRSE survey conducted at a very large scale comprised a two stage stratified random sampling consisting of 1,000 schools.

5.5.2 Reasons for not attending the School

Attendance is one of the most important factors in children's learning processes and achievement. One of the main reasons for sending children to school is to provide them with opportunities for learning and encourage them to develop their knowledge, skills and attitudes.

NLSS I, II, III have captured the primary reasons for not attending school. According to the NLSS (2003/04), overall, 21% of the relevant school population has never attended school. Among these never-attendees, 33% reported that 'parents did not want' them to attend as the primary reason. Other reasons included 'had to work at home' (20%), 'too expensive (19%), 'not willing to attend' (13%) and 'school far away' (3%). Furthermore, there were gender differences. The most cited reason for boys was 'too expensive' (27%) while 'parents do not want' attendance (38%) was the dominant reason for girls. It should be noted that the lack of a nearby school was a factor for only 4% of never attendees. Explaining the high rate of not attending school, the NLSS (2010/11) provided some reasons: 30% of the dropout was because 'parent did not want', 25.5% reported ' help at home' as the primary reason for not attending school whereas 17.2 % indicated 'not willing to attend' to be the key factor.

Similar findings on the reasons for not attending school were highlighted by the TRSE (2006); student's need to work at home (26%), parents do not like children to continue at school (21%), school being too far (9%), lack of proper sitting place (6%), conflict (4%), prohibitive fees (2%), corporal punishment (1%) and others (22%).

The NLSS III (2010/11) surveyed all households where the children had never attended any school. Respondents were asked to provide the main reason for non-attendance. Overall, 8.7% had never attended school which in comparison to the data of NLSS I, is a substantially lower figure. A similar pattern of reasons for not attending school were given. However, the number in regard to some respondents' reasons decreased while others increased. Among those decreasing were 'too expensive' (decreased by 12 percentage points) while 'parent did not want' by 3 percentage points. Nevertheless, among the reasons that showed an increase 'help at home' increased by 5.5 percentage points and 'not willing to attend' by 4 percentage points.

In general, schools were not able to retain students for the reasons mentioned above based on NLSS and TRSE findings. The magnitude and direction of reasons are related with socio-economic background and the cultural context of the student. The NLSS (I, II, III) indicated three main reasons, need to help at home 'too expensive' and 'not willing to attend'. The government must pay attention to these to improve attendance at primary level.

At the macro level, the supply of education by the state (access to education with a school location with a minimum distance from the children's household) and the demand for education by parents and communities (the amount of income and educational level of parents) seem to be the key determinants for enrolment. The main reason for never sending their children to school is the parents' ability to afford the direct costs (uniforms, textbooks, pencils and lunch expenses) and indirect costs (opportunity cost of releasing children from work within and outside the home). Furthermore, the analysis clearly indicates that children, particularly girls from low income groups, less educated families, living in areas where school are distant, are less likely to attend school.

5.6 Enrolment, school size and attendance at school (based on own Survey 2011/12)

The primary data collected specifically for the thesis was through a survey. In terms of methodology, a multi-stage stratified sampling approach was adopted where six districts were selected within each geographic stratum (Mountain, Hill, Terai), 30 sampled schools were then chosen from each of the selected districts. These 30 schools were randomly selected encompassing all of the eco-belts (the Mountain, Hill and Terai), private schools (20%) and government schools (80%); in the same proportion as national statistics. These schools were selected from a total of 6 districts out of 75 districts (on the basis of low, medium and high HDI index; two from each index and EFA achievement league tables). School related information (enrolment, student attendance and school facilities) were collected by using survey questionnaires.

In Nepal, the geographic structure and distribution of the population is quite uneven, diverse and complex in terms of gender, ethnicity and geography. According to the HDI (2010), the Mountain and Hilly regions comprise 77% of the total area and just over half (53%) of the total population. In the Mountain and Hilly regions, because of the rugged nature of the terrain, it is more difficult to implement educational programmes and activities and for people to access them. The Terai, on the other hand, comprises only 23% of the total area, and has almost half (47%) of the total population, and because the land is reasonably flat it is easier to implement educational programmes. The geographical disparity between the regions is one of most important, challenging and constraining issues for planners, policy makers and development partners contributing to this sector.

Government schools are scattered throughout the country (mountain, hill and Terai) whereas private schools are located in the urban and city centre areas. The expansion of primary schools in terms of number and availability is increasing in order to ensure the right to education for primary school children as well as to accomplish the EFA target in Nepal.

5.6.1 Enrolment of students per school

Enrolment figures were taken from school admission records. School size was calculated by dividing the total number of students in the school by the total number of schools in the sample.

At the national level the average number of students per school was 171, which is slightly higher than that of government schools 141 and substantially lower than private schools 291. Furthermore, there is a 51 percentage point difference between private and government, 41 percentage point difference between private and the national average and only a 17.5 percentage point difference between government schools and the national average. This clearly demonstrates that there are notable differences in the average number of students per school between the government and private schools. This indicates that private schools have a higher average number of average students than state schools in this sample.

From the gender perspective, the proportion of girls to boys is almost equal in all eco-belts except in the Terai region in contrast to the Kathmandu Valley where the number of girls is higher than the number of boys.

Looking at the distribution and dimension of enrolment and average number of students in the different eco-belts. There are large differences between each sampled school. The Mountain and Kathmandu Valley have a substantially lower number of students than the national average compared with the Hill and Terai eco-belt.

It is noteworthy that, based on student enrolment in the sample schools, the intra-district variations are wide. Looking at the average number of students per school, the Mid-Western Terai district Banke (305), the Western-Hill district Kaski (235), and the central-region district Chitwan (214) have a considerably higher number of students per school compared with the Eastern Hill district Illam (80), Kathmandu valley (112) and the mountainous and extremely remote district Humla (122).

This also shows a need for a further investigation for the real causes of such low student enrolment in these regions. These figures are of serious concern and draw attention to the need for urgent action regarding the formulation and implementation of the educational plan.

There could be several reasons for this, possibly due to the quality of education, the care taken in relation to student learning and teaching activities, regularly reporting mechanisms (maintaining the school diary) regular feedback on homework for the students, for information to parents, and the role of the head teacher in efficient utilization of the available resources, better management and leadership.

Furthermore, there could be several other reasons for the low number of enrolments in government schools, most people are of the opinion that parents in urban areas prefer to send their children to private schools rather than government schools. The reasons why parents do so could be that they believe that a better quality of education is provided in the private schools; as English is the medium of instruction, they have a wider range of facilities, services and they use modern teaching methods.

5.6.2 Difference between Enrolment and Attendance of students

The enrolment figures were taken from the school admission records. Head count attendance is the number of students physically present on the day the researcher visited (it was an unannounced visit). Average attendance was estimated on the basis of students' attendance on one particular day in three consecutive months in the academic year from the school attendance record i.e. student register.

Table 5-14 shows enrolment, headcount and average attendance of the students by types of school including gender. Private school average attendance is 92.5%, although during the head count we found only 84% of students present in school. By contrast, in government schools only half of the enrolled students were attending.

The average attendance of the students re-affirms that student attendance in private schools is substantially higher than in government schools in the country. The private schools have higher attendance by 31 percentage points compared with government schools. Furthermore, government schools have a substantially lower attendance compared with the national average.

The distribution of head counts of the students across government and private schools show that there are slightly more boys than girls in both types of schools. However, these findings were not statistically significant (p = 0.780).

Table 5-14 Enrolment, Headcount and average attendance numbers by type of school

Types of Schools	Total Enrolment			Average Attendance (as in %)			Head count Attendance (as in %)		
	Boy	Girl	Total	Boy	Girl	Total	Boy	Girl	Total
Government	1830	1546	3376 (N=24)	51.0	57.9	54.1	52.0	55.2	52.8
Private	954	749	1748 (N=6)	94.9	95.1	92.5	80.0	93.2	83.6
Total	2784 (N=30)	2340 (N=30)	5124 (N=30)	66.0	68.7	67.2	61.6	65.4	63.3

Source: Author's Survey 2011/12

A huge difference exists in the enrolment, average attendance and head count attendance between government and private schools. There could be several reasons for this. Most possibly, due to their circumstances, students have enrolled but failed to attend during the normal school day; the teachers may not have taken the attendance register accurately or there may be poor and inconsistent record–keeping systems in the school; hence the recorded attendance rate is not very reliable and considerably lower in government schools.

Looking at it from the gender perspective, the attendance of girls was higher than that of boys in both private and government schools. The headcount of girls who were studying in private schools was almost 93%, whereas in government schools only 54% of girls were attending. This shows that there was large variation in attendance between the girls attending private and government schools.

5.6.3 Are there any differences between Enrolment, Headcount and Average Attendance of students?

The Table 5-15 shows enrolment, headcount and average attendance of the students by types of school by eco-belts (Mountain, Hill, Terai and Kathmandu Valley). The mountain belts recorded significantly lower attendance with only 33.6%

students in school on the school visit day. It is interesting to note that there was a huge difference between the school recorded attendance (87.7%) on their register compared to the actual head count of 33.6% in this region. The researcher asked the head teacher about the low attendance to which he responded that due to a local festival, a large number of students had not attended school.

The head count attendance of boys was found to be better than girls in each of the eco-belts. However the distribution of boys and girls attendance across the four eco-belts was statistically significantly different (p = 0.047).

Table 5-15 Enrolment, Headcount and average attendance numbers by Eco-belt

Eco-belts	Total Enrolment			Average Attendance (as in %)			Headcount Attendance (as in %)		
	Boy	Girl	Total	Boy	Girl	Total	Boy	Girl	Total
Mountain	255	233	488	90.6	84.5	87.7	33.7	33.5	33.6
Hills	985	905	1890	64.5	62.5	63.6	63.4	67.5	65.3
Terai	1230	845	2075	60.7	70.9	64.8	64.5	75	68.8
KTM Valley	314	357	671	88.2	68.6	70.1	67.2	58.3	62.4
Total	2784 (N=30)	2340 (N=30)	5124 (N=30)	66.0	68.7	67.2	67.2	65.4	63.3

Source: Author's Survey 2011/12

There is substantial variance between the eco-belts. The headcount attendance for the Hilly region, the Terai region and the Kathmandu Valley have almost identical attendance, whereas in the mountain region there is substantially lower attendance.

Similarly Table 5-16 shows enrolment, headcount and average attendance of the students by types of school by ethnicity (Mainstram, Janajati and Dalits). Looking at the figures from an ethnicity point of view, it is noteworthy that the head count and average attendance percentage of Janajati was the highest amongst the three ethnic groups of students. There was a difference of 6 percentage points in headcount and average attendance for mainstream students in comparison with non-mainstream (Dalit and Janajati) students, where only a 3 percentage point difference existed.

In both Grades II and IV, over 75% of the sampled school children followed the Hindu religion and the remaining 25% followed other religions (Buddhist, Christian and others). The attendance data show that substantial differences existed between these two groups. Moreover, in both grades the non-Hindu (Janajatis') children were far less likely to have been present during the school visit day.

Table 5-16 Enrolment, Headcount and average attendance numbers by Ethnicity

Group of ethnicity	Total Enrolment			Average Attendance (as in %)			Headcount Attendance (as in %)		
	Boy	Girl	Total	Boy	Girl	Total	Boy	Girl	Total
Mainstream	1792	1376	3168	63.1	67.4	64.9	56.36	62.7	59.1
Janajati	620	572	1192	75.8	74.7	75.0	75.48	75.5	75.5
Dalit	372	392	764	64.0	64.3	64.1	63.44	60.2	61.8
Total	**2784 (N=30)**	**2340 (N=30)**	**5124 (N=30)**	66.0	68.7	**67.2**	61.57	65.4	**63.3**

Source: Author Survey 2011/12

Children from the mainstream represent the largest group in the sample and they were most likely to be in school during the school visit day, followed closely by children from disadvantaged and ethnic minority groups namely Dalit and Janajati. Interestingly, on the school visit day, a much smaller proportion of girls from ethnic minority (Dalit) backgrounds were present, irrespective of the geography of the region.

The headcount figures for the mainstream [non Dalit or Janajati] students were lower than the Janajati as were the average attendance figures. Grouping these data according to gender, mainstream boys show a very low headcount of just 56.3%, with an average attendance of 63% compared with mainstream girls (62.7%, and 67.5% respectively). Also the mainstream boys' headcount figure is almost 20% below the Janjati boys' headcount score of 75.5%.

The head count attendance of boys was found to be higher than girls in each ethnic group. However the distribution of boys and girls attendance across the three ethnic groups was not found to be statistically significant (p = 0.264) (For details please see the Annex).

Overall, the patterns of attendance across the 30 schools sampled in this study demonstrated that about 63.3% of all children enrolled in primary level (Grades I-V) were attending during the unannounced school visit days by the research team.

It is noteworthy that, regardless of the districts, schools, or day of visit, school registers' invariably showed the attendance of more children than were actually present. There could be several reasons for this; many parents and other stakeholders shared with our team that the majority of schools wanted to report a high number of students in attendance in order to obtain additional money from the District Education Office (DEO).

Higher numbers of days of attendance and regular attendance will lead to more opportunities for the children to learn. Similarly, the indicators of internal efficiency can be improved if students attend regularly. Higher attendance rates can lead to higher promotion rates and reduce grade repetition and dropout rates.

Enrolment and attendance data including from the survey for the thesis can be summarized as follows:

- There were lower attendance rates in government schools compared to enrolment figures, confirmed by independent headcounts on the day of the researcher's unannounced visit.
- There was a large gap between the government school headcount attendance [52.8%] and private school headcount attendance [83.6%].
- There was a large number of potential students who were not taking the opportunity to learn offered by high access/enrolment figures.

5.6.4 Summary and conclusion

Government statistics in Nepal revealed that enrolment in primary education, in terms of absolute number and annual growth rate, has improved substantially. This scenario correlates with the NLSS (I,II) finding that over an eight-year period (1996 -2004) Nepal observed increased access to primary education (Central Bureau of Statistics, (CBS, 2004). Furthermore, it also demonstrates that during the same period, physical access to primary school, that is, households that have access to the nearest primary school within thirty minutes walking distance, also improved from 88% in 1995/96 to 91% in 2003/04 to 95% in 2010/11.

At the national level, the Janajatis accounted for 40% of the total enrolment figures at primary school level. Out of total enrolment, the proportion rate of Dalit children enrolled in the primary school accounted for only 22% (their proportion of the population is 12% on the national population). Although the national average showed improvement in the enrolment rate of Dalit and Janajati children, it is still very low in different geographic areas and pockets. The situation for Janajati children appears to be better than that of the Dalits, but enrolment is still low compared to the national average. Poverty among Dalits and Janajatis is considerably higher than that of other social groups. This seems to indicate that there is a positive relationship between poverty and education.

Analyzing the above data at national, regional and district levels, leads to the conclusion that enrolment rates are of enormous concern for planners in terms of access, of meaningful participation and quality of education. There are huge enrolment fluctuations, specifically at the intra-district and the school level in primary level education. These disparities are emphasized within deprived social groups including girls, Dalits, and Janjatis.

These variations persist at the geographic eco-belt, district and community level, in some areas where disadvantaged and ethnic minorities live. These data further suggest that enrolment rates are not equitable and inclusive. This clearly indicates that even with the current education policies in place, Nepal may not achieve the EFA targets by 2015 in terms of equity and inclusion.

5.7 Trends in Internal Efficiency at primary Level

The internal efficiency of the system measured in terms of promotion, repetition, dropout, survival and transition rates to upper levels is presented in this section. The data on repetition, dropout, promotion, and survival rates have been obtained from MOE/DOE data. However, the reliability of the data has been frequently questioned by donor partners and stakeholders because of weak and faulty methods of data collection, processing and analysis. In general however, the broad trends indicated by these data reflect the reality of the existing school system in Nepal.

Theoretically, efficiency describes the relationship between the costs of inputs (school input variables) and the output/outcome (enrolment and learning achievement) of the system. The internal efficiency of the system is measured in terms of promotion, repetition, dropout, survival, transition and completion rates. In other words, it measures how a given investment in education improves outcomes of the system in relation to the quality of education. The EFA program anticipated zero repetition and zero dropout by stating that no child will have a friend who repeats a year or drops out.

Table- 5-17 illustrates that out of the total number of students enrolled in the school year 2009/10 in Grade I, only 69.1% were promoted to Grade II, 22.6% students repeated the same grade and 8.3% dropped out of the school education system. It is discouraging to note that a similar situation prevailed in 2011/12. In other words, in Grade I, one in every three students either repeated the grade or dropped out from the school education system in the school years 2009/10 and 2011/12. It is estimated that over one million children out of five million enrolled in primary education either repeated or dropped out. It is disappointing to see that progress in promotion and survival rates is very slow.

Table 5-17 Internal Efficiency, 2009-10 and 2011-12

Efficiency indicators	2009/2010		2011/2012		Differences 2010-2011
	Grade-I	Primary Level (I-V)	Grade-I	Primary Level (I-V)	
Promotion Rate	69.1	81.9	70.8	83.1	1.2
Repetition Rate	22.6	12.1	21.3	11.5	0.6
Dropout Rate	8.3	6.0	7.9	5.4	0.4
Survival Rate to Grade V	-	80.6	-	82.8	2.4

Source: Flash *Report 1, 2009/10 and 2011/12*

At primary level (I-V), out of the total number of students enrolled in the school year 2009/10, only 81.9% were promoted to upper school level. 12.1% of the students repeated a grade level and a further 6% of the students dropped out from primary level. A similar situation persisted in 2011/12.

In general, these school statistics show slow progress in reducing repetition and dropout and improving promotion and survival rates in primary education. There are also considerable differences in terms of gender, ethnicity and geography in repetition rates. The system has not accomplished equity and inclusion in internal efficiency at primary school.

5.7.1 Promotion Rate

The promotion rate is the percentage of students promoted to the next grade in the following year. It shows the efficiency and quality of the education system. The promotion rate takes account of improvement made in reducing repetition and dropout rates in primary education.

At the national level, the promotion rate does not reveal a satisfactory level of student performance. According to FR (2010/11) data, out of 100 students, only 82 were promoted to the next level. However, at district level, these rates are very uneven and inconsistent. Out of 75 districts, 33 districts were performing above the national average and 36 districts were performing substantially lower than the national average. It is interesting to note that the six mountainous districts namely,

Humla (68.4%), Manang (70.4%), Jumla (71.9%), Doti (72.3%) and Bajura (73.6%) were at the lowest levels. These are the government priority areas.

The difference in the promotion rates in Grades II, III and IV is higher as depicted in Table 5-18. Looking at the TRSE dataset, the promotion rate of Dalit students is much lower compared to the national rate over all the Grades (I-V).TRSE concluded that there is a lower promotion rate particularly in the case of Dalit children. There are many over- age and under-age children in primary schools.

Table 5-18 Promotion Rate at Primary Level for National and Dalit FY-2006/07

Description	Grade-I	Grade-II	Grade-III	Grade-IV	Grade-V
National	51.5	76.2	80.8	78.5	62.4
Dalit	34.1	49.5	53.0	49.4	40.1
Difference	-17.4	-26.7	-27.8	-29.1	-22.3

Sources: Technical Review of School Education (TRSE), 2007.

The majority of the under age children, who should be in ECD, are in Grade I. These children are at the beginning of school, so they need to have special support. Furthermore, such extensive support is essential for those children from ethnic minorities and disadvantaged groups (especially for those whose mother tongue is not Nepali and whose parents have never been to school).

There could be several reasons associated with the low level of promotion. The data analyses discussed above have not explored and explained the possible reasons and causes for the low promotion rates. However, according to the UNDP (2004) report, the main reasons for the low promotion and high drop-out rates include large class sizes, many under age children, high repetition rates, and lack of support given in Grade I.

5.7.2 Repetition Rate

The children who, after completion of one whole school year, fail to promote to the next grade, need to re-enrol and repeat the same grade; this is defined as grade repetition. Theoretically, the high repetition rate is an indication of wastage in

educational resources, inefficiency and ineffectiveness in utilizing resources in the education system.

The repetition rates in primary grades are quite high in Nepal. During 1995-2000, the average repetition rate at primary level decreased to 18.9% from 22.4% with little variation between boys and girls. The average repetition rate slightly decreased to 17.8% during 2000-05 (See Annex XII for more details).

The repetition rate, especially in Grade I is the most serious problem as it was over 40% during 1995-2000 and was still over 30% in 2005. Grade I enrolment consists of under-age and over-age children. It may be that these children lack commitment due to the absence of pre-primary/ECD classes.

At the national level, the repetition rate does not demonstrate a satisfactory level of performance. According to Flash Report (2011/12), out of 100 students almost 12 students repeated the same grade at primary level. Furthermore, these rates varied widely at the district level. Out of 75 districts, there were 43 performing above the national average and 22 performing at a substantially lower level. It is interesting to note that the five districts with the highest levels of repetition were Humla (21.3%), Doti (20.9%), Bajura (20.4%), Sankhuwasabha (17%), these all are mountainous districts) excpet Pyuthan (18.8%). These are the government priority areas.

High repetition rates were found in the low HDI attainment districts, which are situated in the mountain, hill and poor area of Terai. The lowest grade repeater districts were in Kathmandu valley (1.7%) *viz* Kathmandu, Lalitpur and Bhaktapur and the far western Terai districts namely Kailali (3.2%) and Kanchanpur (2.9%).

The high level of repetition is one of the key issues in the school education system in Nepal. These rates are substantially higher in government schools and seem to be a common phenomenon particularly for those located in rural and difficult geographical areas.

The high repetition rates can be attributed to late enrolment, the burden of household work that children have to bear, irregularity of school operation, low income households, inappropriate location of schools for disadvantaged

communities, the perceived low relevance of education, caste and ethnic discrimination, and the medium of instruction not being in the mother tongue.

5.7.3 Drop-out Rate

The students, who do not successfully complete their education and leave during the school year, are known as drop-outs. In the year 2011/12, out of 100 primary level students, five dropped out before completion of their level of education.

However, at district level, these rates vary widely. Out of 75 districts, there are 38 districts performing above the national average, and 36 districts performing substantially lower than the national average. Out of those 36 districts, 6 districts are characterized with low drop-out rates. These districts are Kathmandu (3.2%), Makwanpur (3.3%), Chitwan (3.4%), Kapilbastu (3.6%), Banke (3.7%) and Bardia (3.7%). These are urban Terai districts. There are six high drop-out districts namely, Manang (16.2%), Jumla (12.7%), Mustang (11.3%), Prabat (10.6%), Kalikot (10.3%) and Mugu (10.2%). These are the mountainous and difficult geographic areas. These areas are government priority areas. Drop-out rates are improving in line with government priorities. There could be several reasons for this, but this research has not covered the possible causes and reasons.

Table 5-19 reveals the difference in drop-out rate at primary level between national average and Dalits. The TRSE data showed that, at national level, drop-out rates in all Grades (I-V) are high. The drop-out rates for Dalit children are much higher in all grades and warrant serious attention if universal primary education is to be achieved.

Table 5-19 Drop-out Rate at Primary Level for National and Dalit FY-2006/07

	Grade-I	Grade-II	Grade-III	Grade-IV	Grade-V
National	23.2	6.8	4.8	5.7	26.0
Dalit	49.7	36.9	35.3	38.1	49.6
Difference	-26.5	-30.1	-30.5	-32.4	-23.6

Sources: Technical Review of School Education (TRSE), 2007.

Furthermore, the dropout rates of Dalit students are the highest (almost 50 percent) in Grades I and V. There is a huge gap between national and Dalit children in terms of drop-out rate. The difference in the dropout rates between national and Dalit range from 24 to 32 points in the primary grades. These figures show that the drop-out rate for Dalit students at primary level is substantially higher compared to the total number of students at primary level. More sustained and targeted efforts are needed to reduce drop-out rates, especially for disadvantaged children.

Drop out is a common phenomenon in government schools particularly among girls from disadvantaged ethnic minorities and economically poor communities. It is one of the serious educational problems in Nepal. It is one of the most critical forms of wastage causing low efficiency in primary level education. There is variation in primary school drop-out by gender, eco-belts, ethnicity and by districts. However, the variation in drop-out between eco-belts is not significant statistically.

The TRSE (2007) found that the examination fee for poor students was one of several “push out” factors leading to children dropping out. Enrolment of over-age children is also a key factor contributing to dropouts especially in Grade I.

As noted by Sabates et.al, (2010) drop-out is often a process rather than the result of one single event in Nepal. Many factors are associated with dropout, some of which relate to the individual, children's household situations, school level factors and school location.

5.7.4 Survival Rate to Grade - V

According to the MDGs, to achieve universal primary education, children everywhere must complete a full cycle of primary schooling. In line with the MGDs, to commitment the EFA program made significant efforts to focus on drop-out issues. Survival rate to Grade V is one of the major educational outcome indicators for primary level, which indicates the proportion of children enrolled in Grade I who eventually reach Grade-V. A high survival rate to Grade-V signifies that the education system is more efficient and capable of retaining students from lower grades in the system with minimum wastage.

Tables 5-20 and 5-21 show the trends and annual growth rate patterns of survival rate to Grade V during 2003-2012. The survival rate to Grade V reached 84% in 2012 from 60% in 2003. This is lower than the set target of 90% by 2015. This shows that not all children enrolled in Grade I continue their education throughout the grades of primary education, which indicates that the country is not on track to achieve the target of EFA by 2015.

Table 5-20a Trend on Survival Rate to Grade-V by Gender, 2003-2007

Student	2003	2004	2005	2006	2007	Difference 2006 - 2007
Girls	60.2	80.6	75.9	77.4	78.6	1.2
Boys	59.3	72.4	82.1	83.0	83.4	0.4
Total	59.7	76.2	79.1	80.3	81.1	0.8

Source: School Level Educational Statistics of Nepal and Flash I Reports 2004-2007

Table 5-20b Trend on Survival Rate to Grade-V by Gender, 2008-2012

Student	2008	2009	2010	2011	2012	SSRP Target by 2015	GAP (Target Vs. Achievement)
Girls	85.5	74.1	79.8	81.2	84.9	90.0	5.1
Boys	84.3	72.6	77.9	80.4	83.1	90.0	6.9
Total	84.9	77.9	80.6	82.8	84.2	90.0	5.8

Source: School Level Educational Statistics of Nepal and Flash I Reports 2008-2012

The MDGs/UPE have the aim that all children of eligible age must enter Grade I on time, continue their education throughout the primary grades, complete the primary education cycle and transfer to the upper level of school education.

The Flash Report data does not show substantial improvement in the survival rate (pupils starting in Grade I and reaching Grade V), demonstrating low internal efficiency of primary education in Nepal. The analysis of the official statistics reveals that the goal of universal primary education is not moving at a satisfactory pace in terms of internal efficiency i.e. repetition, drop-out, promotion and survival rates at the primary level. The extremely high rates of repetition and drop-out result in low promotion rates, indicating low efficiency and huge wastage of educational resources, especially for disadvantaged children who need quality primary education the most.

5.7.5 Primary Cycle Completion

According to a World Bank study[14], out of 100 children who enrolled in Grade I, only 18 completed the cycle five years later in 2001. Completion rate refers to the students who consistently attended school from Grade I to Grade V and passed the Grade V examination. However, an analysis of grade progression shows that out of every 100 students enrolled in Grade I, only 32 reached Grade V in the year 2000 and 45 in 2005 (Table 5-22). The high repetition and dropout rates contributed to the low completion rate.

Table 5-21 Nationwide Grade Progression Rate based on DOE statistics from 2000- 2009 as in Percentage (%)

Enrolment/ Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Grade I	1319	1333	1288	1320	1362	1659	1441	1334	1485	1472
G I	100	100	100	100	100	100	100	100	100	100
G II	48	59	58	60	58	63	58	66	72	67
G III	43	44	53	52	52	54	53	51	61	66
G IV	39	42	42	50	49	52	48	51	48	57
G V	32	36	38	39	44	45	44	45	48	45

Source: Consortium for Research on Education Access, Transition and Equity (CREATE) (2006) and updates

The estimated Grade V survival rate based on the grade progression rate is very low (45%), indicating that many students who enrol in Grade I do not stay until Grade V for various reasons, although some of them eventually reach Grade V after repetitions. There is no progress in the Grade V progression rate after 2004.

Overall, the magnitude and trends for these measures of 'internal efficiency' were largely identical for boys and girls across Grades I-V during the entire period. In general terms, these figures show modest improvement in promotion and a slight reduction in repetition and dropout rates across primary school grades.

The slow progress in retention and completion in primary education together with the significant number of school leavers/drop-outs at this level gives rise to serious

[14] The World Bank, Nepal: Priorities and Strategies for Education Reform. Washington, D.C.: Human Development Unit, South Asia Region, July 18, 2001.

concerns for appropriate policies to be developed address the issues of quality and marginalization. The status of efficiency indicators clearly shows the weak performance of the school system.

5.7.6 Why Children drop out and causes in the school

The Flash Report, TRSE data and their interpretations do not explicitly explain the possible causes and reasons for high level drop-out which is a common phenomenon in government schools. The reasons for drop-out rate are multiple and complex, with the relative incidence of particular factors influenced by the country's situation and the level of educational development. Overcrowded and poorly equipped schools with inadequately trained teachers contribute towards high drop-out (GMR, 2008). Hunt (2008) concluded that there are many factors associated with the process of dropping out from school. Some of these factors are specific to the individual child, such as poor health, malnutrition or lack of motivation to study.

In conclusion, it is clear that over and under aged children are more likely to drop-out towards the end of the primary cycle than children who are of the appropriate age for their grade. Furthermore, as expected, most of the drop-outs and out of school children are in families with uneducated parents, live in rural and difficult areas and come from low income households. The number of girls in this group is particularly high.

It is essential to address the drop-out problem in the school education system in Nepal because many children who are enrolled in schools fail to attend, fail to learn and fail to progress. As a result they drop out from the school. Such students leave without acquiring the most essential basic skills in literacy and numeracy that would help them later in life.

For many children who start school but are unable to complete even primary education there are multiple factors which are responsible for their dropping out. It is likely that these risk factors begin to accumulate even before students enrol in school. These include: poverty, parents with no education, weak economic circumstances, family size, pattern of schooling of siblings and lack of pre-school experiences.

The causes of dropout and repetition at primary level are described by the following reports: MOES (1997), BPEP Master Plan (1997-2002), Kathmandu Nepal (see Box-1)

Box 1: Causes of dropouts and repetition

School Related	***Family Related***
• Lack of adequate physical facilities (crowded classrooms, lack of instructional materials, primary grades attached to lower secondary and secondary schools, absence of curricular activities) • Low teacher motivation (low quality of teaching, teacher absenteeism, poor student handling, lack of training) • Language problem (Nepali as medium of instruction using textbooks in Nepali, absence of teachers who can speak the language of the community) • Lack of effective needs-based scholarship and no-fee policies (inefficient use of school time, no incentive mechanism for better performing schools and students, ineffective supervision) • Failure in annual examination	• Poor economic conditions (inability to meet direct costs e.g. stationary, school uniform, and other materials for children, high opportunity costs as children have to work, look after younger siblings, do household chores, and work on farms) • Enrolment of underage children in Grade I due to lack of ECD classes • Absence of parental help in doing homework given by schools • Lack of awareness (limited parental participation in school activities, low level of parental education, parental indifference to children's irregularity in attending schools)

Source: MOES (1997), BPEP Master Plan (1997-2002), Kathmandu Nepal, p 240
Note: A survey of 180 households based on random sampling from selected districts (Kathmandu Education Foundation, 2000, Cost Sharing Research in Education, Kathmandu, Nepal) indicated the causes of dropouts as (i) lack of money to pay for school expenses, (ii) need to work at home, (iii) need to earn money, (iv) child's illness, (v) no schooling tradition for grown up girls, (vi) lack of child's interest, (vii) problem in family such as parent's death, divorce, illness etc, (viii) failure in grade, (ix) corporal punishment at school, (x) perception of school completion, and (xi) early marriage.

5.8 Overall Summary and Conclusion in relation to the first research question

In relation to the proposed initial research question: 'To what extent is Nepal's progress towards EFA inclusive and equitable progression assessed by using different EFA educational barometers such as, student enrolment, number of schools, student attendance, the NER, GER and internal efficiency indicators (promotion, dropout, repetition and survival rate to Grade V) over time. The data are mainly based on secondary sources from the Flash Reports I & II, NLSS I, II, & III reports, TRSE reports and the researcher's own survey (2011/12).

Over the last decade the Government of Nepal (GoN) has pledged to provide Universal Primary Education (UPE). It has made a huge investment (i.e.18% of the national budget in education for 2012) in order to increase access to education for all primary school aged children.

Government policy initiatives have been underpinned by a strong commitment to reducing gender inequality. However, the data suggest that in reality this is not being achieved and that government policies appear to be at a rhetorical level. Existing policy and programmes seem inadequate and inappropriate to address the current situation. The aim of this research was not to find out possible reasons for this but it does reveal that there is gap between policy commitment and programme formulation and implementation.

To summarise, the majority of primary school aged children have access to education at primary school at a reasonable level, irrespective of their gender, caste, ethnicity, geography and economic circumstances.

Enrolment in primary schools increased from 2.7 million (1990) to 3.6 million (2005) over a period of fifteen years, and finally reached 4.9 million in 2011. There has been a rapid increase in enrolment during the period 1990 to 2008 with a long term average growth of 3% per annum. There is an upward trend in the number of schools set up by the government over the same period of time. However, there is uneven fluctuation (increase and decrease) in both the primary school enrolment figures and the number of the schools during that time.

Nepal has made impressive progress towards universalizing access to primary education with NER 95% in 2012. There has been a consistent increase in the overall Net Enrolment Rates (NERs) for primary level from the year 1990 (60%) to 2011 (93.5%) reaching 95% in 2012. The trend on NER is positive, with the number of new entrants increasing. The NER at the national level seems to be at a satisfactory level; however, these rates are uneven at district level with some pockets of real backwardness, particularly where ethnic minorities live.

For example, the NER ranges from 81.3 % in the eastern region to 87.4% in the western region. In the central region, girls' NER was low (71.2%) and high in the far-western region (84.7%) in the year 2012. Moreover, there are vast intra-district variations in NER, for instance, in the remote western mountain districts, Manang (40%) and Mustang (65%) which are very low compared to the national average. Furthermore, the figures are substantially lower for ethnic minorities (59%), Dalit (63%) and Muslims (less than 50%).

Similarly, high repetition and drop-out rates are a common phenomenon for public schools in Nepal and more prominent for disadvantaged groups particularly girls. At the national level, the drop-out rate is 23%, whereas the rate is significantly higher for Dalit (50%). In terms of intra-district variation, there are almost 47% of districts (35 out of 75 districts), which have drop-out rates below the national average (TRSE, 2007). Therefore, considerable differences persist in relation to gender, ethnicity and geography.

The high NER statistics and improved internal efficiency rate for education does not necessarily mean that high quality learning opportunities are being provided and that there is completion of primary level education particularly by ethnic and indigenous minorities.

High drop-out and repetition rates are more prominent in these element of the population. In addition to that there is a large group of hard core children who are out-of-school going age and need to be brought into the education system. Thus, the data and analyses demonstrate that existing policies have failed to lead to equitable and inclusive access to education at primary level in Nepal.

The low internal efficiency rate is critical and this rate is not uniform across the country and varies by gender, ethnicity, geography and between districts. This is one of the serious challenges for educational wastage that is affecting educational development and achievement in the Nepalese educational system. Theretofore, the government needs to review existing policy and programmes. While government policies have focused on access to primary education (number of schools and enrolment has increased), the quality of education has remained the same and in some cases has deteriorated. Access to education at primary level in Nepal is at a satisfactory level, however, both the quality of education provided and retention rates (repetition and drop-outs) are inequitably distributed across the social groups. This, in turn, has made the public education system less efficient and inequitable and as a result it faces more complicated and specific challenges.

Despite some noteworthy achievements, the country has yet to overcome major challenges and pertinent development issues to achieve EFA by 2015. It is, however, important to note that there is growing concern raised by parents and stakeholders that even though their children are attending school they are not sure whether or not they learn or to what extent they learn.

In spite of significant efforts and several noteworthy policy initiatives for the improvement of primary education in Nepal, huge problems still remain. The rate of EFA progress is too slow because school access is too uneven with deep and consistent disparities between eco-belts and more specifically at intra-district and school level. As a result, there is still a long way to go to achieve the EFA target by 2015 with regard to equity and inclusion.

CHAPTER - SIX

DATA ANALYSIS AND INTERPRETATION (LEARNING OUTCOMES OF PUPILS)

6.0 Background

The first research question investigated access to education in Nepal and showed that it was inequitable and not inclusive. This continues to be one of the most urgent policy level issues and debates for government and planners in Nepal. Chapter 5 concluded that marked differences existed in regions, geographic areas and in gender particularly in girls from Dalit and ethnic minorities from the poorest regions, and low income groups. Inequitable and non-inclusive trends remain an obstacle and a hurdle to be overcome in order to accelerate progression in education for entire social groups.

There is a direct connection between access and the quality of education. In relation to access to education, the quantitative expansion of primary school education has resulted in a consistent increase in enrolment with more children enrolled than ever before. However, the quality of that education is one of the most important aspects of primary level education.

The second research question will inquire as to whether or not primary school children learn within the existing school system. A further investigation was carried out into the differences in learning outcomes in terms of gender, ethnicity and geography. Moreover, to what extent are there differences in learning outcomes between government schools and private schools?.

Most of the private schools in the country operate in the city centres, and the district headquarter periphery. The number of private schools in the rural areas is relatively small. In private schools, the class-sizes are relatively small, administration is efficiently carried out and the teachers and students are, for the most part, regularly attend. Also pre-primary education experiences are strong features of the private schools. It is generally accepted that private schools perform better than government schools based on the student performance.

The second research question was designed to investigate and examine these issues at primary level. Therefore, the research examined the level of learning performance of the students in numeracy and literacy. To address this research question, the students were tested by using the ASER tools administered individually in the school.

The main objective of this chapter is to report the measurement of the learning achievement of school aged children. Furthermore, it will determine to what extent the children learned and at what level they achieved, based on the ASER achievement scores.

The researcher's team used the ASER tool to test 493 children from Grades II and IV in the sample of 30 schools across the country. The following section will focus on the test student's attainment level based on their ASER test scores by gender, ethnicity, eco-belt and district.

Furthermore, the test scores of Grade II and IV students were categorized into government school students and private school students. The Pass Percentage Rate, including descriptive statistics such as; the Mean Scores, Standard Deviation (SD), and Coefficient of Variance (CV) for each group of students were also calculated so that the variability of the scores could be examined. A t-test was performed in order to find out whether or not the differences between the mean scores of government and private school students were statistically significant.

Finally, based on the analysis and interpretation of the results, some possible conclusions are drawn and recommendations made for the further improvement of the school education system in Nepal.

6.1 How the ASER test was conducted and its scoring system?

The ASER test was used with two age groups, Grades II and IV in both Nepali and maths. Randomly selected students participated in the test. The target was to test 10 students in each age group in each of the 30 schools, giving a test sample of 600. Due to the low number of students present in many of the government schools, on the testing days the final number tested was only 493.

Table 6.1 demonstrates the composition of the students participating in the ASER test. Out of 493 students, 54% were boys and 46% were girls. It was expected that the 80% students from the government schools and remaining 20 % from the private schools maintaining the equal proportion of boys and girls (for detail please see Chapter 2, section 4, part C) were considered for the test. A more or less similar pattern as expected was seen in government (71.4%) and private schools (28.6%). The distribution of the students by ethnicity was about 68% from mainstream (privileged group) and the remaining 38% from disadvantaged groups (i.e. 23% of students from Janajati and 15% from Dalits). Similarly, the distribution in regards to the eco-belt was about 11% from the Mountain, 38% from Hills, 32% from Terai and 19% from Kathmandu valley. The distribution of boys and girls across the types of schools was found to be different but did not reach statistical significance (p = 0.485).

Table 6-1 Composition of Student participating in the ASER Test
(in absolute number, percentage (%) in parenthesis)

Types of school	Boys	Girls	Total	%
Government schools (n=24)	187 *(53%)*	165 *(47%)*	352 *(100%)*	71.4
Private schools (n=6)	80 *(58%)*	61 *(42%)*	141 *(100%)*	28.6
Total	267 *(54%)*	226 *(46%)*	493 *(100%)*	100.0

Sources: Author calculated based on primary data collected by a survey 2011/12.

Table 6.2 depicts the criteria for scoring a pass in the Nepali test using the ASER tools. The ASER test specifies a level of attainment in each subject at each grade which constitutes a pass level. For example, at Grade II in Nepali, a 'pass' consists of successfully reading any four single words chosen from a list of common words. At the second level of the test the lowest level is the successful recognition of any four single alphabet letters chosen from a list (Ka to Gya). For Grade IV, a 'pass' consists of successfully reading a story. At the second level of the test the lowest level to pass is the successful reading of text (I and II) comprised of a few easy paragraphs.

Table 6-2 Criteria for scoring as 'PASS' in the for Nepali Test ASER

Description	Grade II	Grade II (Pass scores)	Grade IV	Grade IV (Pass score)
Indentifying Nepali alphabetical single words	Ask the child to read any five *alphabet letters* from the 10 letters	Out of 5 read of which 4 must be correct		
Identifying single words	Ask the child to read any five *words* from the 10 common words	Out of 5 read of which 4 must be correct.		
Reading short paragraphs of text (easy and simple)	Ask the child to read the short text (five sentences)		Ask the child to read the short text (five sentences).	They must read the text correctly
Reading short story (hard and complex)	Ask the child to read a short story		Ask the child to read a short story	They must successfully read the full story

Sources: Annual Status of Education Report (ASER) 2010.

Table 6-3 sets out the ASER maths tools. The ASER test specifies a level of attainment in each subject at each grade which constitutes a pass level. For example, at Grade II in maths a 'pass' consists of successfully reading or indentifying four numbers from a list of ten common double digit numbers (11-99). At the second level of the test the lowest level is the successful recognition of any four numbers chosen from a list of eight single digit numbers (1-9). For Grade IV, a 'pass' consists of two successful attempts at division (a single digit number used as a divider with a three digit number) from the eight division options provided. At the second level of the test the lowest level to pass consists of two successful attempts at addition or subtraction (with double digit numbers) from the eight sum options provided (see Tables 6.3 and 6.4).

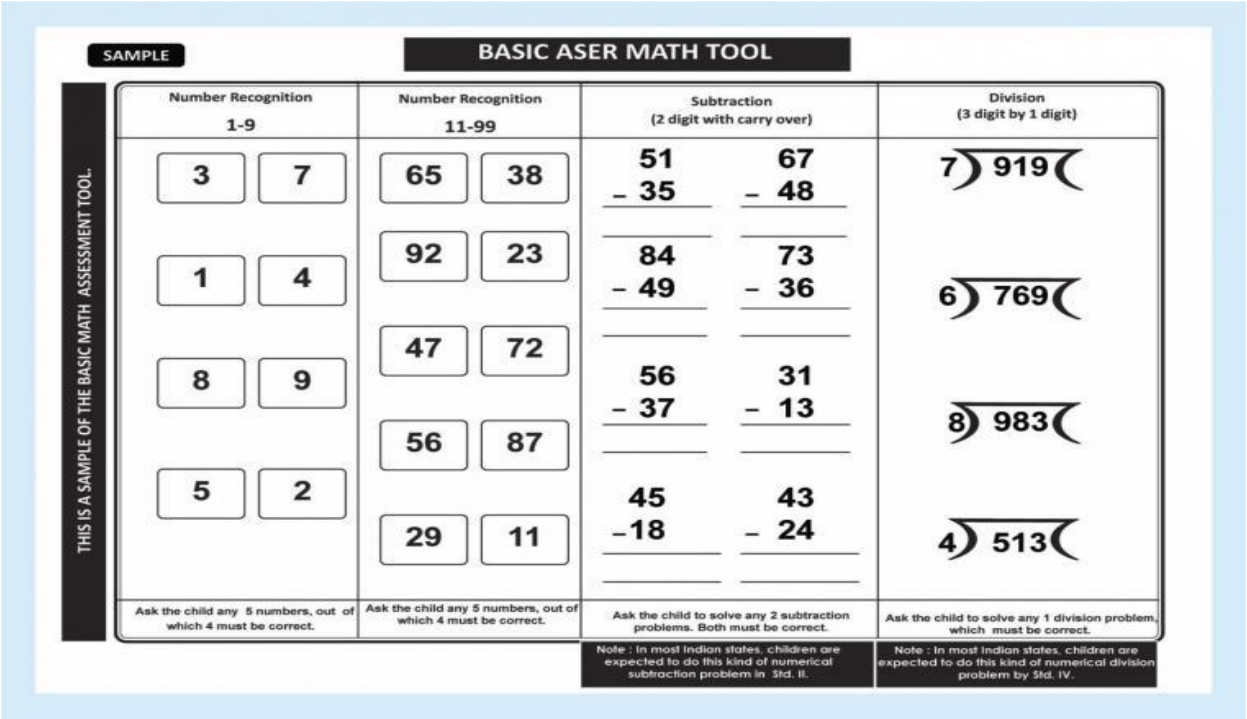
Table 6-3 Criteria for scoring as 'PASS' in the ASER Maths Test

Description	Grade II	Grade II (Pass scores)	Grade IV	Grade IV (Pass score)
Identifying single digits (1-9) Eight numbers	Ask the child to read from the given list, any 5 numbers out of which 4 must be correct	The child must correctly read any 4 numbers out of 5		

Identifying double digit numbers (10-99) Ten numbers	Ask the child to read any 5 double digit numbers out of which 4 must be correct	The child must correctly read any 4 double digit numbers out of 5		
Two digit carry over sum (addition) number	Ask the child to solve any 2 sum problem. Both must be correct		Ask the child to do two successful attempts at addition. Both must be correct	The child must be able solve the sum/addition correctly
Divisions (a divider with three digit number)	Ask the child solve any 1 division problems, which must be correct		Ask the child to solve any 1 division problem, which must be correct	The child must be able solve the division correctly

Sources: Annual Status of Education Report (ASER) 2010.

Table 6-4 ASER Tools for Maths



Sources: Annual Status of Education Report (ASER) 2010.

6.2 Analysis of the Learning Outcomes of Student Performance on ASER

6.2.1 All schools (Government and Private schools)

At the national level, in Nepali at Grade II, only 77.6% of the students recognised and correctly read the single alphabet letters. About 48.4% of the students were able to do this meeting the ASER criteria as a 'pass'. There was a large number of students (more than 62%) who were unable to pronounce and read single words. However, it is interesting to note that, there were 27.2% students who could read text I and II (simple paragraph) and a further 20.7% who could read a story (for details see Table 6-5).

Table 6-5 Percentage pass rate on ASER Test in Nepali at Grades II and IV

Grades	Nepali Score (NEP_SCOR1)	Nepali Score NEP_SCOR2 (Grade-II)	Nepali Score NEP_PASS_SCOR	Nepali Score NEP_SCOR3	Nepali Score NEP_SCOR4	PASS % Nepali Score NEP_SCOR5 (Grade-IV)
Grade-II	77.6	48.4	48.4	27.2	27.2	20.7
Grade-IV	89.9	86.2	67.2	68.4	62.3	60.7

Sources: Author calculated based on primary data collected by a survey 2011/12

At Grade IV in Nepali, only 90% of the students recognised and correctly read the single alphabet letters. About 60.7% of the students were able to do this as per ASER criteria as a 'pass'. However, large number of students (almost10%) were unable to pronounce and read alphabet letters and single words. It is interesting to note that these students were found in equal proportion in private and government schools (for details see Table-6-5).

Table 6-6 Percentage pass rate on ASER Test in Maths at Grades II and IV

Grades	Score Level I MATH_SCOR1 (1-9)	Score Level 2 (MATH_SCOR2) (11-99)	Grade II (Math_pass)	Score Level 3 (MATH_SCOR3) (subtraction double digit with carry out)	Score Level 4 (MATH_SCOR) (Division 3 digit by 1 digit)
Grade-II	89.8	43.9	43.9	5.7	4.9
Grade-IV	97.2	76.1	36.0	18.2	15.0

Sources: Author calculated based on primary data collected by a survey 2011/12

Table 6-6 reveals the ASER test scores for both Grades II and IV. At Grade II, the results showed a different pattern. There were a significantly higher number of students (more than 90%) who were able to recognize and correctly read a single digit number (1-9). However, the scenario was reversed in recognizing and correctly reading double digit numbers (11-99). Only 43.9% of students were able to do this

well enough pass. It is also worth noting that only a few students (less than 5%) were successfully able to do sums and division.

At Grade IV, there was a significantly higher number of students (more than 97%) who were able to recognize and correctly read a single digit number (1-9). However, 24% of students were not able to recognize and correctly read double digit numbers (11-99). It is also worth noting that, only a few students (less than 15%) were successfully able to do sums and division at a pass level (for details see Table 6-6).

Government schools only

Tables 6-7 and 6-8 reveal the ASER test scores for both Grades II and IV for both subjects for government schools. In government schools at Grade II, in Nepali only 37.9% students recognized and accurately read single words, and below this level only 70.7% recognized and correctly read single letters. Only 20.1% could go on to read a simple paragraph, and only 14.4% could read the simple story.

At Grade IV in Nepali some 56.2% reached the expected standard, with some 85.4% able to read single words (the Grade II pass level). However that meant that 15 % students were still unable to do so.

Table 6-7 Percentage pass rate on ASER Test Nepali at Grades II and IV (Government only)

Grades	Nepali Score (NEP_SCOR1)	Nepali Score NEP_SCOR2	Nepali Score NEP_PASS_SCOR	Nepali Score NEP_SCOR3	Nepali Score NEP_SCOR4	Nepali Score NEP_SCOR5
Grade-II	70.7	37.9	37.9	18.4	20.1	14.4
Grade-IV	89.3	85.4	64.0	65.7	58.4	56.2

Sources: Author calculated based on primary data collected by a survey 2011/12

At Grade II, in maths the pass rate on these tasks was only 31.6%. Some 31.6 % of those tested could name double-digit numbers. However, there were still 14% of students who were unable to recognize the single digits (1-9) numbers, also there were close to 68% who were still unable to name double-digit numbers after two years of schooling.

Table 6-8 Percentage pass rate on ASER Test in Maths at Grades II and IV (Government only)

Grades	Score Level I MATH_SCOR1 (1-9)	Score Level 2 (MATH_SCOR2) (11-99)	Grade II (Math_pass)	Score Level 3 (MATH_SCOR3) (subtraction double digit with carry out)	Score Level 4 (MATH_SCOR) (Division 3 digit by 1 digit)
Grade-II	86.2	31.6	31.6	2.3	1.7
Grade-IV	96.6	71.3	28.1	13.5	10.7

Sources: Author calculated based on primary data collected by a survey 2011/12

At Grade IV, in maths the pass rate on these tasks was only 10.7%. Some 71.3% of those tested could name double-digit numbers however there were close to 30% who were still unable to reach the Grade II pass level, two years later.

6.2.2 Differences between Private and Government schools

As might be expected, the pass percentage rates on the ASER test for private schools are twice as high as those for government schools, irrespective of school location (eco-belts and districts).

Table 6-9 and Figure 6-1 demonstrate that the pass percentage rate on ASER test scores between government and private school in both Nepali and maths were different in Grades II and IV.

In maths, the results were low. Only 15% of students passed the ASER maths test. Private schools (26.1%) performed better than government schools (10.7%). There was a significantly high number of students (more than 29%) who were not able to recognize and correctly read double digit numbers (11-99).

Similarly, 2% of the students were unable to read single digit (1-9) numbers (see Table 6-8). These groups of students were found in government schools only. Furthermore, in a few government sampled schools no student successfully attempted the sum/addition and division.

At grade II, the pass percentage rate of private school students in Nepali was 36 points higher than for government schools. Similarly, for private school students the average score for maths was 42 points higher than in government schools.

At Grade IV, these differences were less. The pass percentage rates of students in private schools in Nepali was 16 points higher than in government schools.

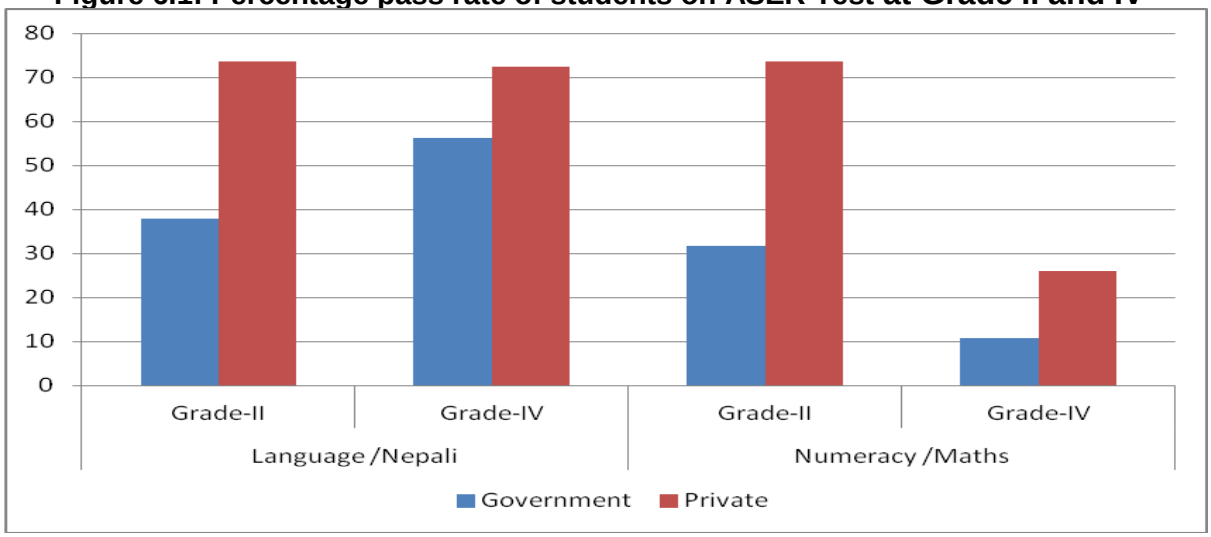
Similarly, the average score of private school students in maths was 15 points higher than in government schools. The differences the pass percentage rate for Nepali was significantly higher than for maths for both Grades II and IV. In both grades the students were better performing in Nepali in comparison with maths.

Table 6-9 Percentage pass rate on ASER Test score by school types at Grades II and IV

Grade/School type	Government (N=312)	Private (N=181)	Difference (Pvt. – Gov.)	Total (N=493)
Language/Nepali				
Grade-II	37.9	73.6	35.7	48.4
Grade-IV	56.2	72.5	16.3	60.7
Numeracy/Maths				
Grade-II	31.6	73.6	42.0	43.9
Grade-IV	10.7	26.1	15.4	15.0

Sources: Author calculated based on primary data collected by a survey 2011/12

Figure 6.1: Percentage pass rate of students on ASER Test at Grade II and IV



As expected, this analysis suggests that the government schools were achieving at a considerably lower level than private schools. In relation to dispersion and variability of scores, government school students' scores were found to be more scattered with greater differences than private schools (except in Kathmandu).

The proportion of students passing in private schools at Grade II (Nepali) was found to be significantly higher (73.6% vs. 37.9%, p < 0.001) than in government schools. By looking at the results of the Nepali test at Grade IV, there was higher proportion of students passing in private schools (72.5%) as compared with the government schools (56.2%). This was statistically highly significant (p < 0.001).

A similar pattern was found in maths at Grade II as in Nepali for the same grade. The proportion of students passing in private schools at Grade II (Maths) was significantly higher (73.6% vs. 31.6%, p < 0.001) than in government schools. Whereas in maths at Grade IV, the pass percentage of students in both types of schools was found considerably lower. However, the performance of private school in this subject was considerably better as compared with government schools. The proportion of pass students in private schools was (26.1%) and in government schools (10.7%). This was statistically highly significant (p < 0.001).

6.2.3 Gender differences in performance between Government and Private school at Grades II and IV

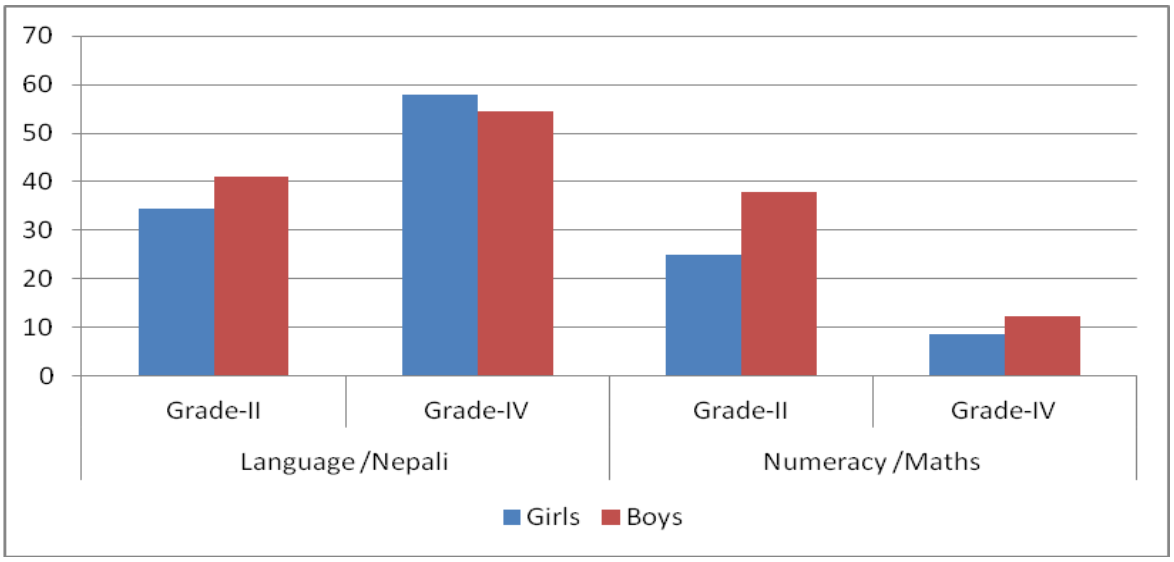
Table 6-10 and Figure 6-2 show the pass percentage rate between boys and girls in private and government schools in both Nepali and maths. As expected, disparities exist between boys and girls regardless of geography, ethnicity and level of income.

Table 6-10 Percentage pass rate on ASER Test at Grade II and IV by Gender

Grade/Gender	Girls (N=267)	Boys (N=226)	Difference (Boy – Girl)	Total (N=493)
Language /Nepali				
Grade-II	34.5	41.1	6.6	37.9
Grade-IV	58.0	54.6	-3.4	56.2
Numeracy /Maths				
Grade-II	25.0	37.8	12.8	31.6
Grade-IV	8.6	12.4	3.8	10.7

Sources: Author calculated based on primary data collected by a survey 2011/12

Figure 6-2 Pass percentage on ASER Test score by Gender at Grade II and IV



The pass percentage rate of boys both in Nepali and maths for both Grades II and IV was higher than for girls' except for Grade IV, where girls scored higher (3.4 percentage points) in Nepali (see Table 6-10).

When the variability of scores was compared, girls' percentage pass rate were found to be more variable than boys' in both subjects, irrespective of geography, ethnicity and districts. These data further demonstrate the existence of considerable gender differences in students' performance in both subjects.

The proportion of boys passing the Nepali test at Grade II was found to be slightly better than girls (41.1 % vs. 34.5%). However this difference in the percentage pass rate between girls and boys were not statistically significant, p = 0.126). At grade IV, girls were found to be performed slightly better than boys (58% vs. 54.6%) which was also statistically significant (p = 0.025).

In Maths at Grade II, boys did considerably better than girls (37.8% vs. 25%, p[15]. = 0.003). Also at Grade IV, the percentage of boys passing (12.4%) was better than girls (8.6%), though the difference in the percentage pass rate between boys and girls were not statistically significant (p = 0.170).

[15]. A Chi-square ($X^{2)}$ test has employed to compute the difference in 'percentage pass rate' were statistically significant and their level by using with p- value. The significance levels is an indicator of the confidence in this study have observed the result; the smaller the significance level, the more confident. The coefficient is statistically significant at the 5% level, it means that there is less than a 5% possibility that results we observed is due to coincidence. In another words, the 95% confident means, there is certainly a relationship between the associated explanatory variables and the dependent variable.

6.2.4 Geographical differences in performance between Government and Private school at Grades II and IV

It is generally believed that there are considerable differences in percentage pass rate between rural and urban schools. From the researcher's own observation in the sampled schools, the rural schools have weak infrastructure including insufficient school furniture, less experienced and less qualified teachers; lack of instructional materials and no library. The students are believed to be less motivated, frequently absent from school and are also less likely to participate in the learning activities compared to those in urban schools.

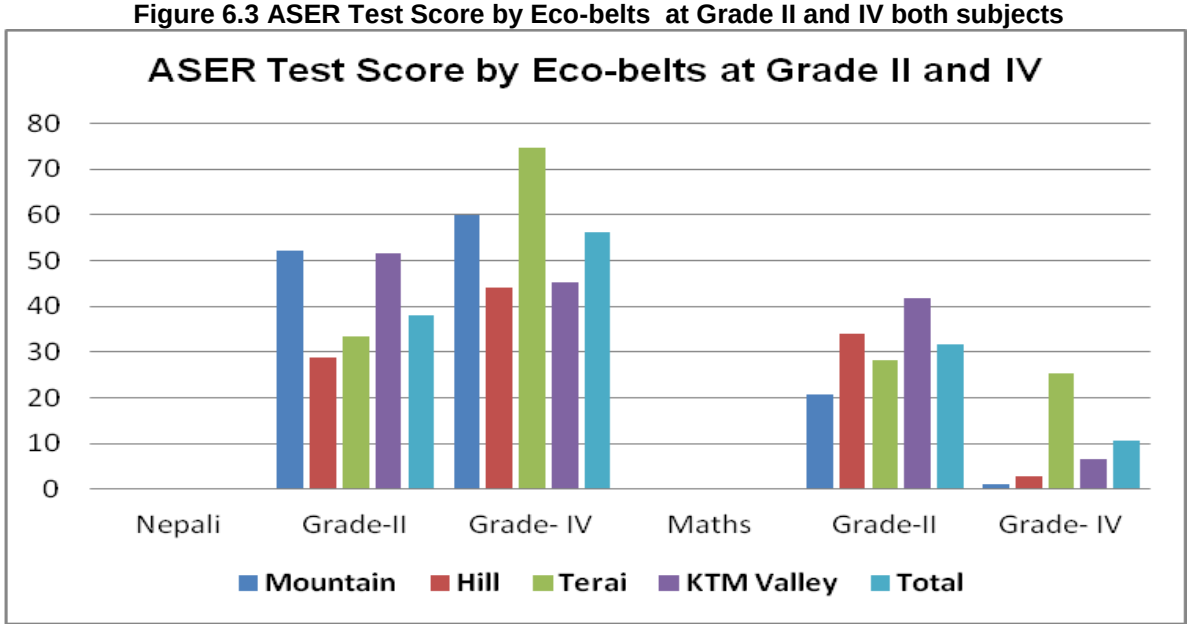
Table 6-11 and Figure 6-3 show the pass percentage rate between eco-belts (Mountain, Hill, Terai, and Kathmandu valley) in private and government schools in both subjects.

Table 6-11 Percentage pass rate on ASER Test at Grade II & IV by Eco-belts

Grade/Eco-belts	Mountain (N=54)	Hill (N=187)	Terai (N=157)	KTM Valley (N=95)	Total (N=493)
Language/Nepali					
Grade-II	54.2	28.8	33.3	51.6	37.9
Grade-IV	60.0	44.1	74.6	45.2	56.2
Numeracy/Maths					
Grade-II	20.8	33.9	28.3	41.9	31.6
Grade-IV	1.0	2.9	25.4	6.5	10.7

Sources: Author calculated based on primary data collected by a survey 2011/12

Figure 6.3 ASER Test Score by Eco-belts at Grade II and IV both subjects



The findings show that the Grade II students of the mountains region have the highest percentage pass rates (54.2%) amongst the three ecological regions and Kathmandu Valley (51.6%) in Nepali and the students in the Hills region have the lowest percentage pass rates (28.8%).

By contrast in maths, the Kathmandu valley have the highest percentage pass rates (41.9%) amongst the three ecological regions and the students in the mountain region have the lowest scores (20.8%).

The Grade IV students pass percentage rates were higher in Nepali in comparison with Grade II. At Grade IV the mountain regions have the highest pass percentage rates in Nepali (60%) and the Hills region students have the lowest score (44%). However the Kathmandu Valley also have low rates (45%) in comparison with other regions .

The Grade IV students percentage pass rates were considerably lower in maths in comparison to Grade II. The Terai region had the highest (25.4%) rate amongst the three ecological regions in maths and the students from the mountain (1%) and hills region (2.9%) had lowest percentage pass rates in the same subject. These data clearly demonstrate that there is considerable difference ($p < 0.001$) in student performance across the four eco-belts in both grades (II and IV) and both subjects.

6.2.5 Differences in Government schools and Private schools by Ethnicity at Grades II and IV

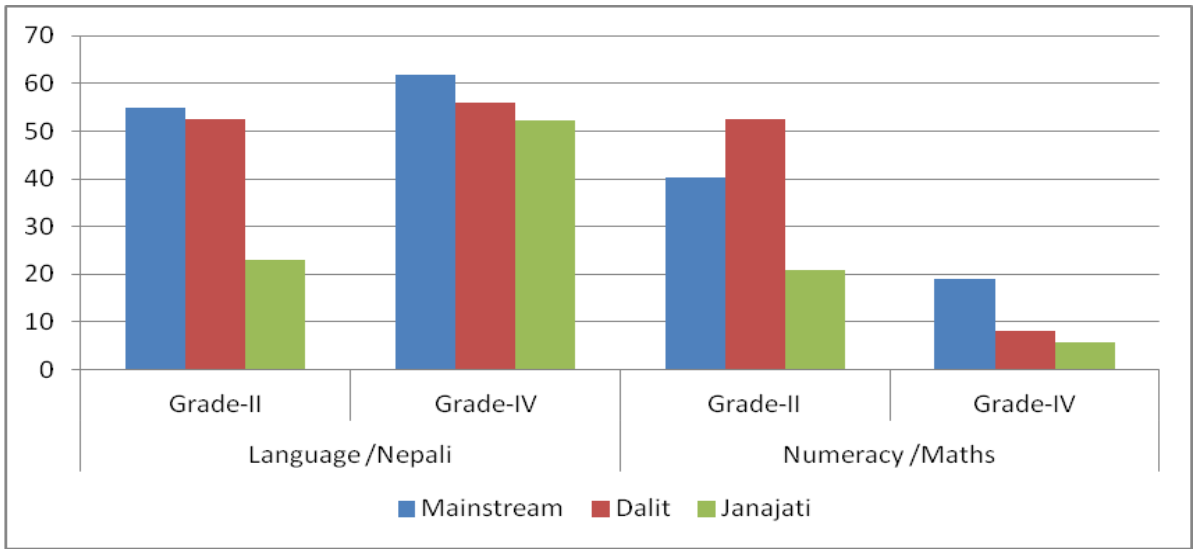
Table 6-12 and Figure 6-4 show the percentage pass rates for different groups ethnic groups in private and government schools in both Nepali and maths for both Grade II and IV.

Table 6-12 Percentage pass rate on ASER Test at Grade II and IV by Ethnicity

Grade/Ethnicity	Mainstream (N=160)	Dalit (N=44)	Janajati (N=289)	Total (N=493)
Language/Nepali				
Grade-II	54.8	52.4	23.1	37.9
Grade-IV	61.9	56.0	52.2	56.2
Numeracy/Maths				
Grade-II	40.3	52.4	20.9	31.6
Grade-IV	19.0	8.0	5.6	10.7

Sources: Author calculated based on primary data collected by a survey 2011/12.

Figure 6-4 Percentage pass rate on ASER Test by Ethnicity at Grade II and IV



Mainstream student performance shown as the percentage pass rate in Nepali at Grade II is the highest compared to Dalit and Janajati students. The lowest percentage pass rate is that of the students from Janajati ethnicity 23% and 21% for Nepali for each grade and 5.6% for maths at Grade IV. Similarly, the percentage pass rate of the mainstream students is the highest at 55% and 40% for Nepali and

61% and 19% for maths. The percentage pass rate of Janajati students is the lowest in Grade IV in Nepali.

In numeracy (maths), the percentage pass rates in both Grade II and IV of the mainstream students are higher than the pass percentage rates of the students of the other two ethnic groups.

Figure 6.5 Percentage pass rate on ASER Test by Districts at Grade II and IV

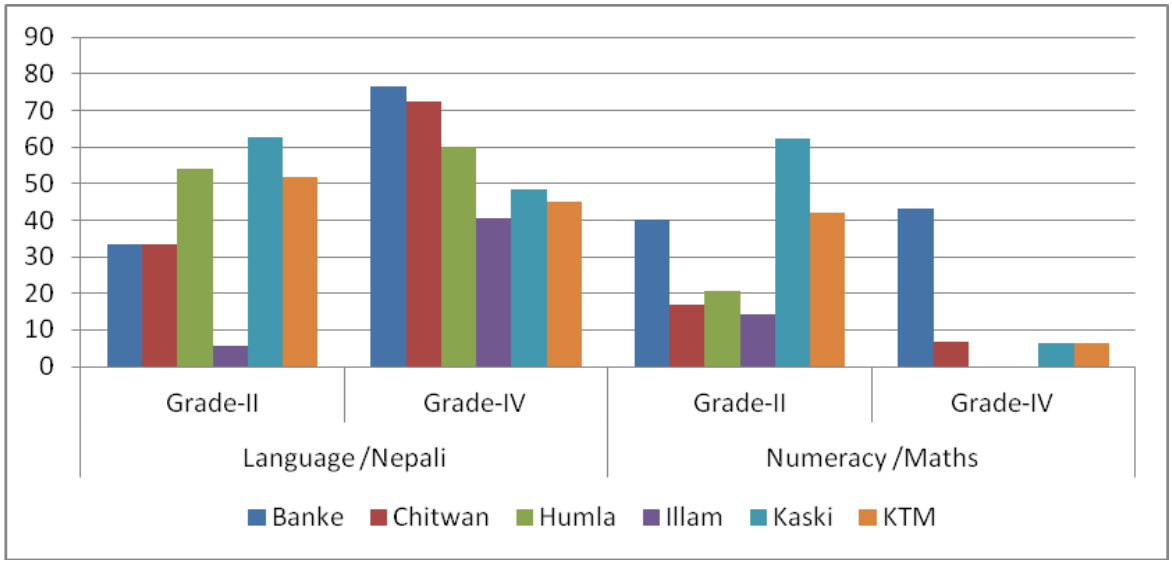


Figure 6-5 sets out the percentage pas arte for the ASER test by district looking at the intra district variation, the percentage pass rate of the Grade II students from the Kaski district is the highest amongst the six sampled districts in Nepali. Similarly, the percentage pass rate of the Grade IV students from the Banke district is the highest at 77%. The percentage pass rate of the students from the Ilam district in Grade II is extremely low, around 6%. The lowest percentage pass rate scores in Grade IV is from the students from the Ilam district.

The variability of the percentage pass rate was examined. In the rural districts, non-mainstream students (Janajati and Dalit) particularly in the mountain and hilly areas had more variable percentage pass rates than in urban and mainstream districts in both subjects.

At Grade II in the Nepali test, the mainstream category of children did better than non-mainstream (Janajati). However, the Dalit children did far better than the Janajati. This variation in the performance of students across the different ethnic groups were found to be statistically significant ($p < 0.001$). At Grade IV in Nepali,

the students' performance was relatively better than that at Grade II. However, the variation of performance was just as statistically significant ($p = 0.043$) across the three ethnicity.

At Grade II in maths, the Dalit group of children did better than the Janajati and mainstream children. These differences were statistically significant ($p < 0.001$). At Grade IV in maths, the percentage pass rate was considerably lower than at Grade II. The variation of performance was statistically significant ($p < 0.001$) across the three ethnicity groups.

Overall, the above analyses clearly demonstrate the existence of gender, ethnicity, eco-belt and district level differences in student performance, as indicated by the percentage pass rate. The data also suggest that private schools perform better than government schools. To achieve equity in opportunity, every effort should be made in order to create an educational environment conducive to teaching and learning in order to reduce the existing differences in achievement between government and private schools.

6.3 Differences between top and bottom performing schools at Grades II and IV

This section highlights the differences between low and high performing schools and their circumstances. It describes the top and bottom five schools based on the percentage pass rate of the ASER test, including location and type. Tables 6-13 and 6-14 provide the names of the schools, their location and type.

Various parameters such as active teaching and learning activities, the availability and quality of resources, and student characteristics including their ability and socio-cultural background are expected to influence the learning performance of a student. Also, there is a strong belief by parents and stakeholders that private schools outperform government schools. As expected, children from the bottom economic quintile attend government schools which have limited resources. In contrast the children from the top economic quintile have a choice of schools to attend either a well-resourced government school or a private school.

It has been shown that there are substantial disparities in student performance at school between the top five and the bottom five performing schools (see Table 5-13 and 14). It is interesting to note that the bottom five schools comprise all of the

government schools from the Ilam, a rural district in the eastern hilly region of Nepal. The majority of the population in this district are Janajati and other ethnic minorities, whose first language is not Nepali. Their economic status is in the low economic quintile in terms of income and wealth. The fact that the language of instruction in school is Nepali which is not their mother tongue could be the most important factor impacting on their learning leading to substantially lower performance than that of children in the other regions. In addition, the majority (80%) of the teachers were from non-Janajati groups who rarely spoke with children in their mother tongue.

The researcher observed that these schools were under-resourced in terms of infrastructure, including buildings, classrooms, desks, additional books and essential teaching and learning materials. Frequent school closures due to local festivals were also common practice. Limited pupil-teacher interaction was observed both within and outside the classroom. The majority of children came to school barefoot and without uniform. These observations reflect the low economic status of the schools, children and the community.

Conversely, the top performing five schools (see Table 6-13) were mostly private schools (75%) with very few government schools (25%) and only those in urban, city centre and capital city areas where socio-economic levels are reasonably high. The parents of these children had high level educational backgrounds, they were very supportive of their children's learning and frequently enquired about their performance at school.

Table 6-13 The Top Five schools on Percentage pass rate on ASER Test score at Grades II and IV

Name of schools	District	Types of school	Grade II (Nepali)	Grade II (Maths)	Grade IV (Nepali)	Grade IV (Maths)
Landmark Int School	Katm.	Private	81.8	100.0	85.7	60.0
Bhagswoti Primary	Kaski	Govt.	100.0	100.0	60.0	10.0
Gauri Primary school	Kaski	Govt.	100.0	100.0	100.0	10.0
Canvas Pri Boarding	Banke	Private	100.0	90.0	75.0	50.0
New Happy Valley EBS	Ilam	Private	90.0	100.0	100.0	37.5

Source: Author calculated based on primary data collected by a survey 2011/12

Table 6-14 The Bottom Five schools on Percentage pass rate on ASER Test score at Grades II and IV

Name of schools	District	Types of school	Grade II (Nepali)	Grade II (Maths)	Grade IV (Nepali)	Grade IV (Maths)
Shree Singh Devi Primary	Ilam	Govt.	10.0	10.0	30.0	0.0
Shree Bandevi Primary	Katm.	Govt.	10.0	2.0	40.0	3.0
Bal Nikaton Primary	Ilam	Govt.	6.0	0.0	50.0	0.0
Shree Singh Adarsa Primary	Ilam	Govt.	3.0	1.0	60.0	1.0
Shree Devekota Primary	Ilam	Govt.	4.0	2.0	62.5	0.0

Source: Author calculated based on primary data collected by a survey 2011/12

Overall, this section has examined the effects of associated input variables on student learning performance, thereby trying to establish why some schools dominate the league tables while others are confined to the bottom rank. A striking finding of the achievement studies was the large differences in pass percentage rate between the top and bottom performing schools. This analysis concluded that the socio-cultural and economic circumstances of children and the medium of instruction are key predictor variables for student performance. The results further indicate that there is a strong positive association between these factors and student performance.

6.4 Analysis of ASER Scores by using mean score and coefficient variance

There were five levels and steps in the test of Nepali and four levels in the test of maths for both Grades II and IV. The scores have been summed in order to obtain the mean scores and the Coefficient of Variation (CV) for both of the subjects and the grades of all of the students. The scores on Nepali range from (0-5) and the scores in maths range from (0-4).

This sub-section includes descriptive statistics such as the Mean Scores, Standard Deviation (SD), and Coefficient of Variance (CV) for each group of students. Variability of scores and levels of significance were also calculated. A t-test was performed in order to find out whether or not the differences between the mean

scores of students in government and private school students were statistically significant.

6.4.1 Student Performance on the ASER Test at Grade II

Table 6-15 presents the mean scores, coefficient variation and pass percentage rates of the ASER test scores of student in private and government schools at Grade II. The mean scores of the students in the subjects Nepali and maths are 2.0 and 1.4 respectively.

Table 6-15 Mean ASER score and Pass Percentage Rate by Gender and school type at Grade-II

Description	% of students	Mean Score		Coefficient of Variance (CV)		Pass Rate (%) in ASER test	
		Nepali	Maths	Nepali	Maths	Nepali	Maths
Total (n = 30)	100.0	2.01	1.44	0.850	0.605	48.4	43.9
Govt. (n = 24)	70.7	1.61	1.22	0.945	0.617	37.9	31.6
Private (n = 6)	29.3	2.97	1.99	0.592	0.459	73.6	73.6
Differences (Private and Government)	-41.4	-1.36 (p <0.001)	-0.77 (p <0.001)	-0.353	-0.158	35.7	42.0
Girls (n = 121)	48.8	2.08	1.39	0.872	0.667	37.9	45.81
Boys (n =125)	51.2	1.94	1.49	0.826	0.548	73.6	54.19
Differences (Boys-Girls)	2.4	-0.14 (p =0.526)	-0.10 (p = 0.368)	-0.046	-0.119	35.7	8.38

Source: Author calculated based on primary data collected by a survey 2011/12

6.4.2 Differences between Private and Government schools

The mean scores in maths at Grade II are higher in private schools than in the government schools (see Table 6-15). The Coefficient Variation (CV) in government schools is higher than in private schools for both subjects. The difference is highly statistically significantly (p <0.001). There is comparatively higher dispersion in the

scores of government school students than the scores of students on private schools.

- **Distribution of scores**

The distribution of scores in Nepali and in maths is shown through the histograms Figure 6-6 and Figure 6-7 respectively. The coefficient of variation in Nepali and maths shows the dispersion of the students' scores in both subjects. The dispersion of students' scores was found to be higher in Nepali than in maths. It can be observed clearly through the histogram (Figure 6-6) that the score in Nepali is not normally distributed whereas the score in maths seems to be normally distributed (Figure 6-7).

Figure 6-6 Histogram of scores in Nepali of Grade II

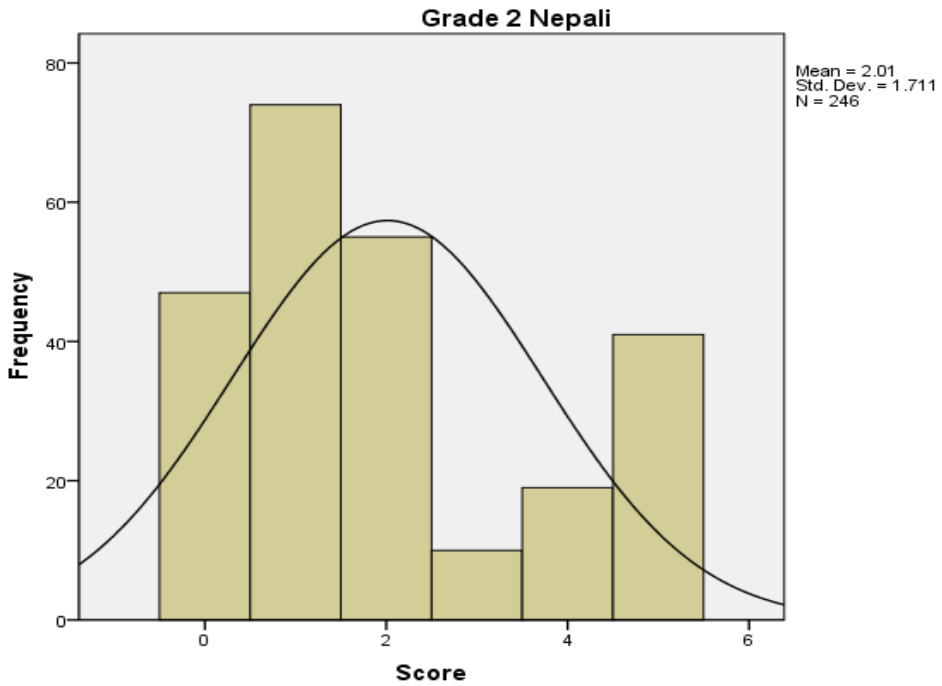
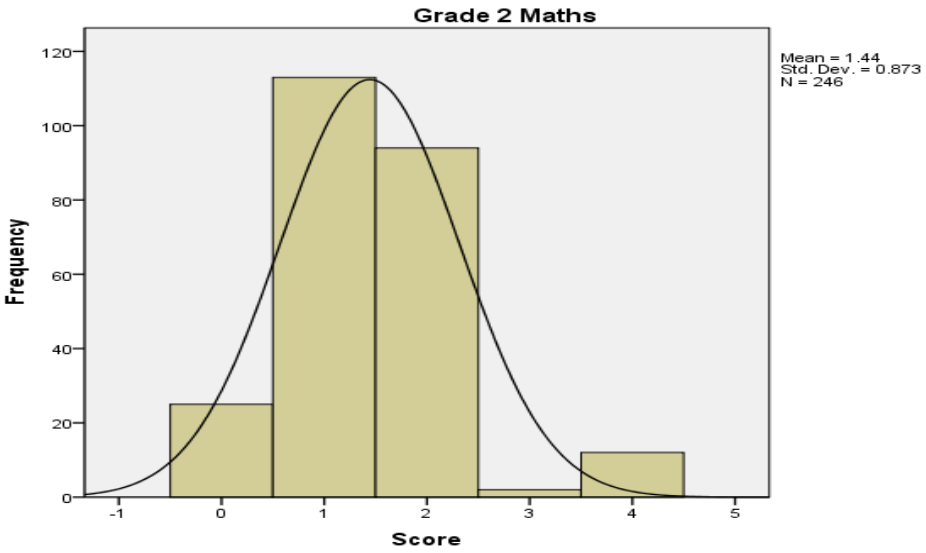


Figure 6-7 Histogram of scores in Maths of Grade II



6.4.3 Difference in Private and Government schools by Gender

From the gender perspective, the sample consisted of 46% girls and 54% boys. The mean score in Nepali was higher for girls compared to boys but not for maths. The difference in the CV of the score for Nepali was comparatively lower than maths between girl and boys. These differences were not statistically significant (p = 0.368 in maths), and (p = 0.526 in Nepali).

6.4.4 Difference in Private and Government schools by Ethnicity

The disparity in performance across ethnic groups is another important dimension. Table 6-16 summarizes the mean ASER scores, CV and percentage pass rates for the three ethnic groups namely mainstream (a privileged group), Janajati (Mongolian faced people, from economic and socially disadvantaged groups) and Dalit (in the religious classification, coded as an untouchable caste, and the most oppressed and economically and socially disadvantaged group).

Table 6-16 Mean ASER score and Pass Percentage by Ethnicity at Grade-II

Description	% of students	Mean Score		Coefficient of Variance (CV)		Pass Rate (%) in ASER test	
		Nepali	Maths	Nepali	Maths	Nepali	Maths
Total	100.0	1.28	1.46	0.38	0.32	37.9	31.6
Mainstream	35.6	0.91	0.98	0.55	0.40	54.8	40.3
Janajati	52.3	1.84	1.95	0.23	0.21	23.1	20.9
Dalit	12.1	0.98	0.98	0.52	0.52	52.4	52.4
(p-value)		(<0.001)	(<0.001)				

Source: Author calculated based on primary data collected by a survey 2011/12

Of the students who undertook the ASER test, 36% were from Mainstream (n=203), 52% were from Janajati (n=233) and 12% from Dalit (n=57) ethnicity. The percentage pass rates of the mainstream and Dalit students in both subjects (Nepali and maths) were much higher than the remaining share of the Janajati population. However, the mean score for Janajati is substantially higher than for mainstream and Dalits. The CV is highest for the students from mainstream and Dalits in both the subjects, which implies that mean scores of these students are more dispersed from the mean. The CV of the mainstram, Janjati and Dalits for both subjects are strong and highly statistically significantly ($p < 0.001$).

In conclusion, this is an interesting finding considering that mainstream students are generally viewed as the dominant ethnic group, and as might be expected, the socio-economically disadvantaged Dalits and Janajatis have the lowest pass rate.

Similarly, it is worthwhile to point out that the CV of the scores is the lowest for Janajati, which indicates that the scores vary the least among members of this ethnic group. By contrast, it can be seen that the CV of the scores is higher for mainstream and Dalits, which indicates that their groups performance variation is also greatest. The student's mother tongue is another related variable that could influence ASER test performance in language and numeracy.

6.4.5 Difference in Private and Government schools by Geography

Table 6-17 demonstrates performance differences among the eco-belts in Nepal. In the discussion that follows, note that Kathmandu Valley (capital of Nepal) is treated separately in recognition of its distinctly higher economic status compared to other regions.

Table 6-17 Mean ASER score and Percentage pass rate by Eco-belts at Grade-II

Description	% of students	Mean Score		Coefficient of Variance (CV)		Pass Rate (%) in ASER test	
		Nepali	Maths	Nepali	Maths	Nepali	Maths
Total	100.0	1.28	1.46	0.38	0.32	37.9	31.6
Mountain	13.8	0.94	1.98	0.54	0.21	54.2	20.8
Hill	34.0	1.58	1.40	0.29	0.34	28.8	33.9
Tarai	17.8	1.44	1.62	0.33	0.28	33.3	52.4
KTM Valley	34.4	0.98	1.20	0.52	0.42	51.6	41.9
(p-value)		(<0.001)	(<0.001)				

Sources: Author calculated based on primary data collected by a survey 2011/12

As might have been expected, the sparsely populated Mountain region has the smallest percentage(13.8%) of students taking the answer test. The Kathmandu Valley and Terai regions, have the largest percentage of students (34.4%).

The data demonstrate that the Terai region is far ahead of the other regions in terms of percentage pass rates in maths at Grade II followed by the Kathmandu Valley. Compared to a percentage pass rate of 41.9 % in maths and 51.6% in Nepali for Kathmandu Valley, the next best performing region was the Terai 52.4% in maths and 33.3% in the Nepali. Interestingly, there is a notable achievement in the Nepali (54.2%) in the mountain region but in maths a considerably lower percentage pass rate (20.8%).

The mean score in maths of the students from the mountain region is highest, whereas the mean score in Nepali of the Terai region is the highest of the other eco regions. Conversely, the mean scores of the students from the KTM valley in maths is lowest, whereas the mean scores of KTM valley is highest. The CV of the

ecological regions (Mountian, Hill, Terai and Kathmandu Valley) are for both subjects, strong and highly statistically significantly ($p < 0.001$).

In conclusion, the percentage pass rate of the students sampled in the KTM valley is higher than in the other eco-belts, followed by the students of the Hill region. The representation of students from the mountain region is the lowest in the sample.

The average percentage pass rate for the different regions also shows the same rank order, with the Kathmandu Valley with a markedly higher rate.

It must be pointed out, however, that although these two regions have similar average scores, the CV of the scores is much higher for the Mountain region. Clearly, the disparity in ASER percentage pass rate among the students within the Mountain region is much greater than the disparity within the other regions.

Looking at the district level, the percentage pass rate of students across the six sampled districts is presented in Appendices. There is almost a homogeneous distribution among the sample districts. Again, this pattern is consistent with the distribution of student enrolment in these sampled districts and national enrolment based on Flash Survey (2010/11) data.

At Grade II in Nepali, the pass percentage rates in the western Hilly urban district Kaski (62.2%) has the best performance, followed by Kathmandu (51.6%) and at the bottom, the Eastern Hilly Illam (5.7%) district having the lowest rates. Surprisingly, the Humla, a far western mountainous district (with no access to a motorable road) has a higher pass rate (54.2%) in Nepali than the other geographically and economically better-off districts sampled.

The mean test score of the students from the Kaski district in Nepali was the highest whereas the mean score of students from the IIlam district was lowest. The mean score in maths was, again, highest for the students from the Kaski district and lowest for the Ilam district. The CV shows that the scores of students from the Ilam district in both subjects were low. Also the CV of the students of the Chitwan district in maths was unexpectedly large showing the dispersion in the scores. The pass rates of student in both the subjects from the Kaski district were the highest and in the Ilam district, the lowest.

6.5 Student Performance on the ASER Test at Grade IV

Table 6-18 presents the mean scores, coefficient variation and pass percentage rates on the ASER test for students in private and government schools for Grade IV for both Nepali and maths.

6.5.1 Difference in Private and Government schools

Table 6-18 Mean ASER score and Percentage pass rate by gender and school type at Grade-IV

Description	% of students	Mean Score		Coefficient of Variance (CV)		Pass Rate (%) in ASER test	
		Nepali	Maths	Nepali	Maths	Nepali	Maths
Total	100.0	3.73	2.27	0.448	0.462	60.7	15.0
Govt. (n=24)	72.1	3.61	2.09	0.463	0.483	56.2	10.7
Private (n=6)	27.9	4.03	2.74	0.408	0.369	72.5	26.1
Differences (Private & Government)	-44.2	-0.42 p = <0.001	-0.65 p = <0.001	-0.055	-0.114	16.3	15.4
Girls (n=141)	43.3	2.08	2.16	0.439	0.502	63.1	11.6
Boys (n=106)	56.7	1.94	2.36	0.457	0.432	58.3	18.4
Differences (Boys-Girls)	13.4	-0.14 P = 0.723	-0.20 P = 0.141	-0.018	-0.070	4.8	6.8

Source: Author calculated based on primary data collected by a survey 2011/12

The mean score of the students at Grade IV in Nepali was 3.73 and in maths 2.27. The above table show the dispersion of the scores of the students in both the subjects.

For students at Grade IV the mean score for Nepali in private schools is higher than in government schools. Similarly, the mean score in maths is higher in the private schools than government schools. The CV of the government schools in both subjects was higher than in the private schools. This difference is highly statistically significantly ($p < 0.001$). There was comparatively higher dispersion in the scores of government school students than the scores for students in private schools.

6.5.2 Difference in Private and Government schools by Gender

From the gender perspective, the sample consist of 43 percent girls and 57 percent boys at Grade IV. The mean score in Nepali (2.08) was higher for girls compared to boys (1.94), but in maths this was reversed boys (2.36) and girls (2.16). The difference in the CV of the scores for both subjects was higher for the girls but not boys. These differences were not statistically significant (p = 0.141for maths) and (p = 0.723 for Nepali).

- **Distribution of scores by using Histogram**

The distribution of scores in Nepali and in maths is shown in the histograms Figure 6.8 and Figure 6.9 respectively. As shown by the histogram the scores on the Nepali were not normally distributed. However the scores for maths seem to be normally distributed. The coefficient of variation in Nepali and maths shows the dispersion of the students' scores in both the subjects. The dispersion of students' scores was found to be higher in Nepali than in maths.

Figure 6.8 Histogram of scores in Nepali of Grade IV

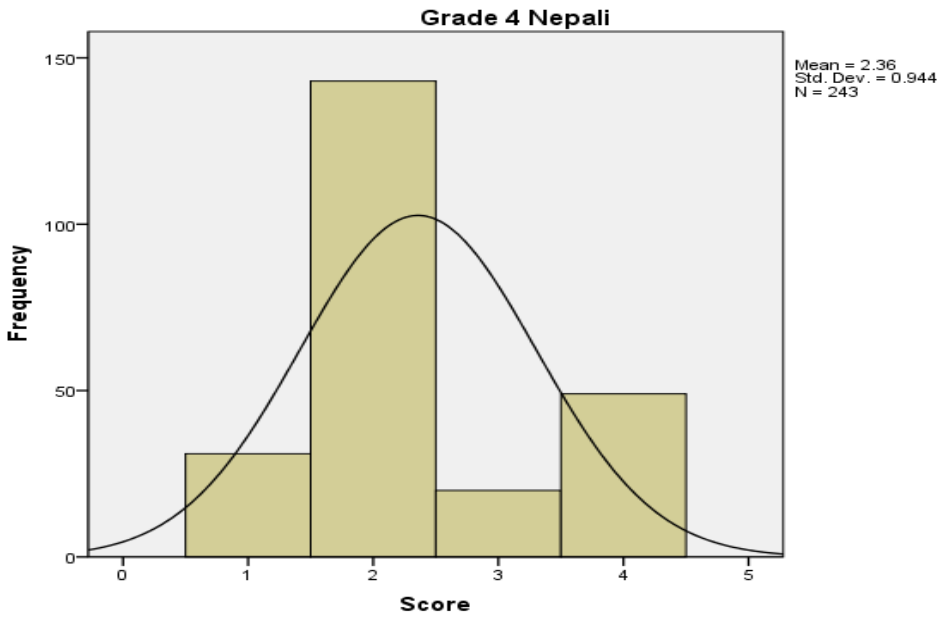
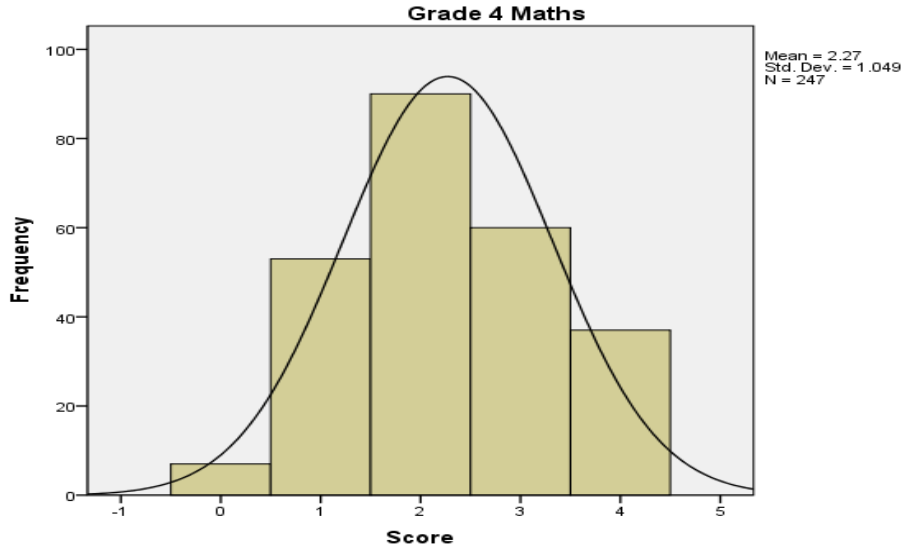


Figure 6.9 Histogram of scores in Maths of Grade IV



6.5.3 Difference in Private and Government schools by Ethnicity

Table 6-19 presents the mean ASER scores, coefficient variation and pass percentage rates on the ASER test for students by ethnicity at Grade IV for both Nepali and maths. The sample comprised thirty six percent of students from mainstream, 52 percent from Janajati and 12 percent from Dalit ethnicity. The mean scores of the mainstream students in Nepali were the highest and the mean scores were lower in the maths for all ethnicities. The CV is higher in maths compared to Nepali, which implies that the mean scores were more dispersed. The Coefficient Variation (CV) and the mean scores for mainstream, Janajati and Dalits are highly statistically significantly different ($p < 0.001$) for both subjects and grades.

Table 6-19 Mean ASER score and Percentage pass rate by Ethnicity at Grade-IV

Description	% of students	Mean Score		Coefficient of Variance (CV)		Pass Rate (%) in ASER test	
		Nepali	Maths	Nepali	Maths	Nepali	Maths
Total	100.0	0.89	2.82	0.56	0.11	56.2	10.7
Mainstream	35.6	0.79	2.08	0.62	0.19	61.9	19.0
Janajati	52.3	0.97	3.83	0.52	0.06	52.2	5.6
Dalit	12.1	0.91	3.46	0.56	0.08	56.0	8.0
p-value		(<0.01)	(<0.001)				

Sources: Author calculated based on primary data collected by a survey 2011/12

6.5.4 Difference in All (Private and Government schools) by Geography

Table 6-20 presents the mean ASER scores, coefficient variation and pass percentage rates on the ASER test for students by eco-belts at Grade IV for both Nepali and maths. The percentage of sampled students who took the ASER test in KTM valley (34%) and the Hill (34%) regions were the highest among in the eco-belts. The representation of students from the Mountain district (14%) was the lowest in the sample.

The mean score of the students in Nepali from the Tarai region was the highest and the mean score in maths of the Mountain region was the lowest, falling to zero. The CV in Maths is almost 6 and 4 points for students from the Hill and KTM valley respectively. The pass rates are highest in Nepali for the students from the Tarai region. The pass rate is very low in maths in all the regions with about 11 percent in total and zero percent in the mountain region. The Coefficient Variation (CV) and the means scores from the eco-belts (Mountain, Hill, Terai and Kathmandu) were highly statistically significantly different (p <0.001) for both subjects and grade

Table 6-20 Mean ASER score and Percentage pass rate by Eco-belts at Grade-IV

Description	% of students	Mean Score		Coefficient of Variance (CV)		Pass Rate (%) in ASER test	
		Nepali	Maths	Nepali	Maths	Nepali	Maths
Total	100.0	0.89	2.82	0.56	0.11	56.2	10.7
Mountain	13.8	0.84	0.00	0.60	0.00	60.0	0.00
Hill	34.0	1.14	5.67	0.44	0.03	44.1	2.90
Terai	17.8	0.59	1.76	0.75	0.25	74.6	25.40
KTM Valley	34.4	1.12	4.17	0.45	0.06	45.2	6.50
(p-value)		(<0.001)	(<0.001)				

Sources: Author calculated based on primary data collected by a survey 2011/12

Looking at the district level, for Nepali, the mean scores of students from the Banke district were the highest whereas the mean scores of students from the Ilam district was lowest. The scores in maths are, again, highest for the students from the Kaski

district compared to other districts among which the Humla and Ilam had zero mean scores. The CV of students from the Kaski district in maths was more than 4 points, implying that the scores are highly dispersed. The pass rates for Nepali for students from the Banke district were the highest and for the Ilam district were the lowest.

This analysis shows that a student's socio-economic background is associated with her or his reading performance to some extent in all sampled districts. However, among the three districts (Kaski, Kathmandu and Chitwan) which had the highest reading performance, two of them, namely Humla and Illam, showed a link between background and performance that is weaker than average for both language and numeracy. This indicates that it is possible to achieve the highest levels of performance through providing students with equitable learning opportunities.

- The exceptions are in Illam and Banke, where the performance gap amongst these two groups of students varied markedly across the districts
- Students were at least twice as likely to perform in the bottom quarter when compared to student who do not have
- In all sampled districts, girls from disadvantaged backgrounds were far more likely to show resilience in numeracy and literacy performance than boys

A similar pattern persisted in Grade IV in Nepali and maths irrespective of gender, ethnicity, urban/ rural, eco-belts and districts. The section below discusses the differences in student performance based on the mean and coefficient variance. It is clear that the inter-district variation in scores is an important dimension of the variation in ASER performance in the nation. The distributions of scores for the best and worst performing districts are shown. The diagram demonstrates that the two districts Kaski and Kathmandu clearly stand out as the best performing districts in the sample. At the extreme lies the Eastern Hill district of Illam. Its ASER score pass rate is very low (5.7%).

There could be several reasons for underperformance in the Ilam districts. From the researcher’s own observation, the majority of the Janajati live in the eastern hill region, in the Illam district, where Nepali is not their first language. They speak in their own mother tongue with their family members and peers. The only time they have to speak Nepali is in school, therefore, this could be the reason why they do not have a very good level of understanding of Nepali and are unwilling to read and write in Nepali.

6.6 Analysis based on *t*-Test:

A *t*-test was performed to compute whether the differences in means were statistically significant. The t-test shows that in Grade II, the mean difference of the scores in both Nepali and maths in government and private schools were not significant at the 95 percent confidence interval. The level of significance measured by the p-value on the t-test was found to be 0.526 (>0.05) in Nepali and 0.368 (>0.05) in maths which is much greater than 0.05; therefore there was no statistically significant difference in the mean scores between these two subjects in government and private schools.

Similarly a t-test was performed in Grade IV to compute the level of significance of the difference between the two means of the students' achievement scores in the Nepali and maths. The mean score in Nepali was higher for girls than for boys, whereas the mean score in maths was higher for boys than for girls. The difference in CV on the scores for Nepali is higher for boys whereas it was higher for girls in maths.

Overall, the above analysis and interpretation clearly reveals two conclusions: (i) on average, the performance of private school students is much better than that of public school students, and (ii) the percentage of students in any high score range is always greater for private school students. Finally, for all schools and public school students, the distribution of scores for the entire sample is, indeed dominated by the performance of government school students.

6.7 Overall Summary and Conclusions

The percentage pass rate of the schools sampled gives an indication of the performance of the students, it does not give any information about variations. It is therefore, instructive to look at the distribution of ASER percentage pass rate among the sample of students across gender, ethnicity, eco-belts and districts level.

In the Nepal, education system, Grades I-V are the beginning grades and foundation stages for all children. The above analysis and interpretation, clearly demonstrates that the vast majority of primary school children were underperforming in terms of their learning performance particularly in government schools. As expected the private schools were doing well.

The underachieving groups of children were unable to recognize and correctly pronounce single letters of the alphabet, to read simple or complex words, paragraphs and simple stories in the Nepali language. Similarly, in numeracy they were far behind, still unable to correctly recognize single or double digit numbers, and carry out simple two digit addition, subtraction, multiplication and division.

At a national level, in Nepali at Grade II, only 70.7% of the students recognised and correctly read the single letters of the alphabet and only 37.9% of the students recognized and accurately read the words. There was a considerably large number of students (more than 62%) who were unable to correctly recognize, pronounce and read words aloud. However, 18.4%, 20.1% and 14.4% of students respectively, were able to successfully recognise, correctly pronounce and read out the text-1 (simple paragraph), text-2 (advanced paragraph) and the story.

In maths the test results were a little different. There was a significantly higher number of students (more than 86%) who were able to correctly recognise and read single-digit numbers (1-9). However, the scenario was reversed for reading double-digit numbers (11-99); there was a considerably lower number of students (31.6%) who were able to correctly recognise and accurately read them out. There were only a few students (approximately 2%) who were able to understand and do the addition and division tasks.

Children whose home language (mother tongue) is different to the language of instruction in school learn less possibly due to the fact that, they are not well motivated to participate in the learning activities in the school.

The government's published educational statistics indicate that the quality of education for primary school aged children is a major concern. The majority of rural primary school children are unable do basic levels of numerical calculation and computation (e.g. addition, subtraction, multiplication and division). Simple reading and correct writing (for e.g. word, paragraph and story) in the Nepali language remain very low particularly for the bottom levels of economic quintile learners. Therefore huge problems, challenges and hurdles remain in relation to policy commitment, educational planning and investment to secure satisfactory outcomes in the primary education sector in Nepal.

The learning outcomes (achievement scores) and competency levels of children are one of the most powerful educational statistics. This measure the success and attainment level of the educational system. Furthermore, this demonstrate to planners, policy makers and development partners to what extent government resources, policies and programmes are fit for targeted groups. Therefore, these findings on learning achievement are very important and assess the policy commitment, programme and plan formulation in relation to the accomplishment of the stated goals and objectives. These findings are linked with the allocation of resources, structure and delivery of the educational program in school education system. Ultimately, important issues emerged which call for a policy level debate and discussion.

CHAPTER - SEVEN

RESULTS AND INTERPRETATION OF THE REGRESSION ANALYSES

7.1 Background

The findings relating to the earlier research questions on the quality of education, revealed that learning performance as measured by pass rate (i.e. percentage pass rate) were low at primary level. The ASER scores set out in chapter six revealed in both types of schools government and private that less than 50% passed in Nepali at Grade II and 61% passed at Grade IV. In maths only 44% passed at Grade II and only 15% passed at Grade IV (see Table 6-5).

However, the private schools performed better than government school in both subjects and grades. In the private schools more than 73% of students passed in Nepali in both Grades II and IV while in maths, almost similar trends persist the ASER test, where the percentage pass rate score was 74% in Grade II and 26% at Grade IV (see Table 6-5).

In addition, there were marked differences found in student attainment in terms of gender, ethnicity and geography. The variability of mean percentage pass rates was large and these differences were statistically significant were found (see Table 6-11 to 6-16).

In the light of these findings, it was important to look at the possible factors that might show high association with the quality of education as assessed by learning outcomes using the standardised ASER test.

This chapter consists of three sub-sections dealing with the analysis and interpretation of the statistical results relating to student performance. It focuses on the relationship between all of the independent variables (predictors) and dependent variables. This chapter presents school level data analysis, individual level analysis and, finally, a summary chart providing a synopsis of the major findings.

7.2 Rationale for the Regression Equation

This study focussed on assessing the most important factors associated with school performance and the individual performance of the students based on the ASER type test scores. In order to identify the significant factors associated with the above outcome variables, the most suitable statistical analysis technique was regression analysis. Regression is a statistical analysis technique for estimating the relationship between the outcome variable and a number of independent variables. It includes many techniques for modelling and analyzing several variables depending on the nature of the outcome or dependent variable. Regression analysis is useful for understanding how the typical value of the dependent variable changes when any one of the independent variables is changed, while the other independent variables are kept constant.

Moreover, regression analysis is one of the most appropriate statistical model especially for two purposes. Firstly, it helps to identify the set of potential predictor variables which are significantly associated with the outcome variable. Secondly, it helps to quantify the predictor variables effect on the outcome variable. In this research also, there are a number of factors which are associated with ~~the~~ school performance based on school level data and also in the case of the individual performance of the pupils. In order to identify the significant risk factors for the school performance and for individual student performance, two separate models namely OLS and logistic regression were used in this thesis work.

For example, if the outcome variable is of interval or ratio scaled level, and the estimation is of the relationship between that outcome variable with number of independent variables, the OLS will be the appropriate regression model. Therefore in this research study at school level, analysis employed the OLS model. However, if the outcome or dependent variable is of the dichotomous type, the relationship between the dichotomous dependent variable and the number of independent variables can be appropriately assessed by using the logistic regression model. Similarly, in this research study at individual level, analysis employed a logistic regression model.

The first part of this section deals with the interpretation of results obtained by employing the OLS method that has univariate and multivariate levels of estimation at the school level. This estimation helps to identify the key determining factors associated with student performance at primary school level in Nepal.

The second part deals with the results generated by applying a Logistic Regression (univariate and multivariate) estimate at the individual student level. This estimation will identify the key predictor variables associated with student performance at an individual level. At both levels (school and individual) of analysis, the models are employed at three levels of significance i.e. at 10%, 5% and 1%.

In this research, stepwise regression has been adopted for selecting the variables in the construction of final multivariate regression model for each level i.e. school level and individual level. This method involves automatic selection of independent variables. Regression works either by trying out one independent variable at a time and including it in the regression model if it is statistically significant, or by including all potential independent variables (candidate variables) in the model and eliminating those that are not statistically significant, or by a combination of both methods. The latter method has been used in the construction of multivariate regression models for the last thirty years in this type of research and will be adopted here.

7.3 Rationale for school level and Individual level Analysis in this research

The primary goal of this section is to analyse the relationship between school input variables and school performance. As discussed in chapter six, the school performance is defined as the average percentage pass rate of students in Nepali and maths at Grades II and IV based on the ASER scores. The outcome variable for the school level analysis is a continuous variable. The association between the outcome variable (percentage pass rate) and the independent variables (determinants of outcome) are assessed by applying an OLS. The approach taken here involves starting with a simple regression taking one independent variable at a time and finally using a multivariate regression analysis.

The final multivariate regression model is built by applying a stepwise forward selection procedure for selecting the variables in the model. The analysis is carried out separately for all the schools (government and private) and for government schools only for Nepali and Maths subjectively for both grades (II and IV).

The performance of the individual student has been measured based on ASER scores. This score is dichotomous in nature and shows the performance of students as either pass (coded as '1') or fail (coded as '0'). Using pass or fail status as the dependent variable, the results of a logistic regression model are estimated using the method of Maximum Likelihood. In this research at the individual level, analysis employed a logistic regression model (for detail refer to Chapter 2.8 page 45).

The sign and magnitude of the coefficient associated with any explanatory variable indicate the direction and strength of the variable relationship with student performance. The beta coefficient (β) with a positive sign for a predictor variable (say X1) indicates that per unit change in that predictor (X1) there is on average increase in the student performance by the quantity of that β. If the beta coefficient (β) is negative for that predictor, then there is on an average a decrease in student performance by the quantity of β per unit change in that predictor. If the considered predictor is of a categorical type, then similar interpretation can be carried out with reference to the level of the categorical predictor.

The value of R^2 explains the goodness of fit of the regression model. A high value of R^2 in the regression model indicates a better fit of the regression model. Hence, R^2 gives the proportion of variation in the dependent variable which is explained by the variation in independent variables through the regression model.

If an explanatory variable (independent) has s statistically significant association with student performance, then the estimated coefficient for that variable is at the 10%, 5% and 1% on the significant level the associate p-value[16]. The signed and

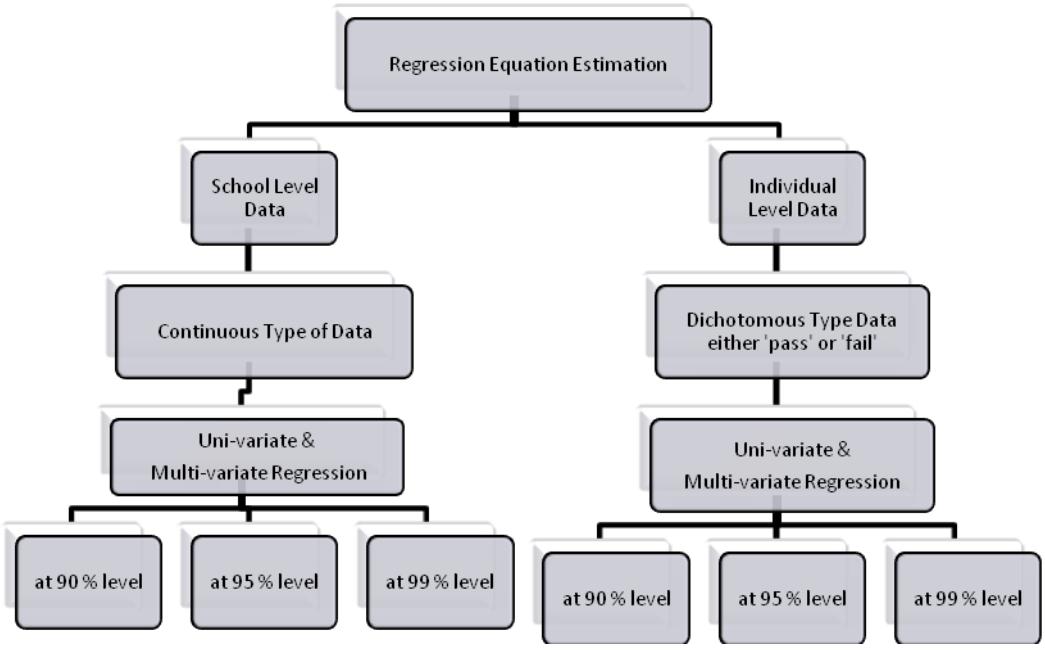
[16] *A coefficient is significant at the X% level if its p-value is smaller than X. For example, the p-value of a coefficient must be smaller than 0.05 for the coefficient to be significant at the 5% level).*

magnitude of the coefficient associated with any explanatory variable indicate the direction and strength of the variables relationship with student performance.

The significance level is an indicator of the confidence we have in the observed result. The smaller the significance level, the more confident we can be that the observed result is not just due to pure chance. For example, if a coefficient is statistically significant at the 5% level, it means that there is less than a 5% chance that the result we observe is because of chance alone. Or we can argue that a significant result at the 5% level of significance is indicative of the genuine relationship between the outcome and the predictor variable. In other words, there will be at least a 95% confidence level that there is a relationship between the associated explanatory variables and the outcome variables.

The figure 7-1 provides and explanation of the regression estimation at school level and individual level. Due to nature of the data, at school level multivariate regression and at the individual level a logistic regression model were employed.

Figure 7-1 Flow chart of Regression Equation



7.4 Variables used in this research and its code

This research with a large data set, rigorous methodology, a strong theoretical framework and utilization of the ASER type tools has not been undertaken before in Nepal. The main value and uniqueness of this research is the collection of a representative national data set. The potential determinants of performance used as an independent variables (explanatory variables) can be broadly classified into the following four thematic categories; School, Student, Teacher and Family related factors. The OLS and Logistic regression models were used for school level and individual level analysis respectively. To carry out these two separate analyses a number of independent variables which were assumed to be associated in some way with the outcome variable were selected. In selecting the independent variables for the study, the following criteria were used.

(I) The nature of the research questions.

(II) Literature from International and in-country research.

(II) Nepal government policy on the school education system and their main priorities.

(IV) The support of the development partners and their initiatives for further improvement in the Nepal primary education policy and system.

The variables were taken from different models and some Nepalese achievement studies drawn from the national and international research. The selected variables were considered to have an affect on and an association with student performance in language and numeracy.

As in much research since the work of Coleman in the 1960s to the work of Hanushek and International test such TIMSS, PIRLS and PISA, four broad thematic areas were employed: student related, school related, teacher related and family related.

In addition, due consideration was given to the structure of Nepalese society, and the need to included underserved disadvantaged social groups and poor people living in difficult circumstances. Drawing on the international literature especially in low-income countries across the globe, the four key themes seemed appropriate to use as the key determinant factors associated with the student performance.

(A) Dependent variables

This study consists of the analysis of the data based on two levels- namely at the individual level and at the school level. In the individual level analysis the dependent variable was students' individual performance which was measured by a standardized test using the ASER type tools (either 'pass' or 'fail') for first time in Nepal. At the school level, the ASER score was an aggregate average score the 'percentage pass rate' was considered as the dependent variable.

The rationale adopted using these two different types of analysis was that the first approach allows the development of understanding of how changes in the determinants are associated with the probability of passing of ASER test. The second approach is devoted to analyzing the relationship between school level performance with the different sets of performance determinants (explanatory variables). The methodological details concerning these statistical approaches are presented in chapter three section 3.8.2.

(B) Independent variables (explanatory variables)

Tables 7-1 and 7-11 show in detail of the explanatory variables including their code. The school related factors comprise school and its facilities including school type, school size, student attendance, the number of days the school is open in a year and school type. These are the most important variables needed to answer the research questions. Previous research also indicated that there were wide disparities in student performance between public and private schools in Nepal using a similar set of independent variables (Thapa, 2011).

Student-related factors relating to socio-economic characteristics were gender, religion, caste and ethnicity. These demographic characteristics are some of the standard variables found in the literature (Levacic and Vignoles, 2003).

Teacher-related variables comprised teacher characteristics including age, gender, qualifications, years of experience, and training. Family related variables are general socio-economic demographic characteristics of the student's family including economic backgrounds, parental literacy, living arrangement and family composition. Wobmann (2000) using TIMMS data found that the test scores of students living with both parent with higher than those of other students. Similarly, in

many research studies have demonstrates that the educational background of parents is one of the family factors that have a strong, significant influence on student performance (Hanushek and Luque, 2003).

7.5 Relationship between Student Performance and its Determinants: School Level Analysis

In this section, the estimation and analyzing of the determinants of performance used ASER scores (which are an aggregate pass percentage rate) as the dependent variable. A linear functional relationship was assumed between educational outcome and the explanatory variables. Using the OLS model, detailed empirical analyses (univariate and multivariate at 90%, 95% and 99%) were undertaken between student performance and school input variables. The input variables were in four broad thematic areas, namely student-related factors, school-related factors, teacher-related factors and family-related factors.

Initial modelling was undertaken at three different levels of significance (90%, 95% and 99%). At first, the model was considered at the 90% significance level including all the input variables (more than 30). However, most variables showed no statistically significant relationships with the outcome variable. Only four variables were found to be significant. Also the magnitude of the beta coefficient was small and the p-value weak. There was no strong relationship between input and outcome variables.

Undertaking the modelling at the 95% and 99% levels of significance very few variables were found to be statistically significant in terms of student performance at the school level in either Nepali and Maths or at each grade II and IV.

The main reason for these unexpected findings may be that the different explanatory variables are measured in different units. There are also many variables with only a relatively small sample size. The rule-of-thumb is usually at least ten observations per variable in order to obtain reliable results. The school-level multivariate regression often contained seven, eight or even ten variables on sample sizes of at most 30 and sometime only 22 observations (schools) i.e. two or three observations per variable. Therefore, it is not surprising that the p-values and beta coefficients in many of the school-level regressions were found to be not

statistically significant. As it seemed unlikely that further analysis would contribute anything to the existing literature or policy or strategy debates no further analysis was undertaken at school level.

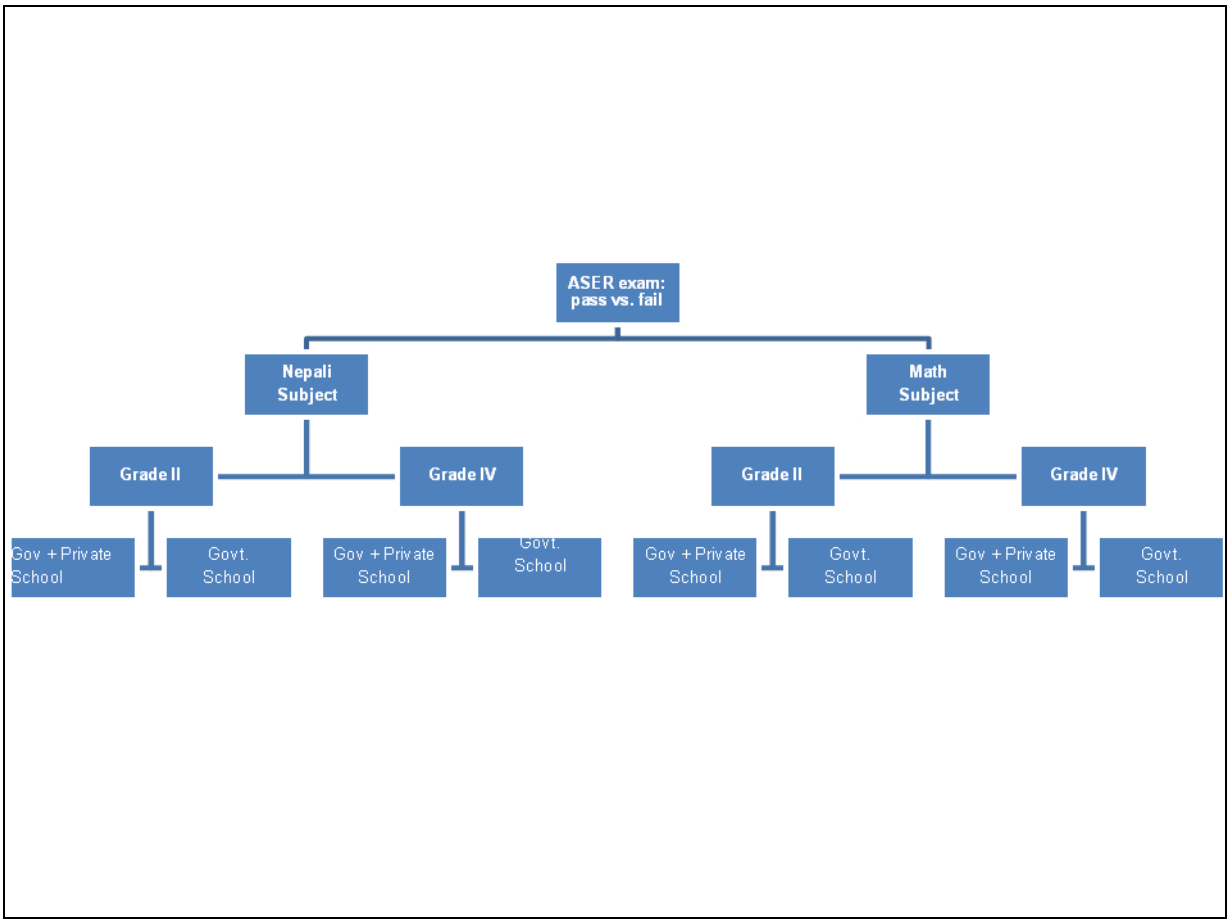
7.6 Relationship between Student Performance and its Determinants: Individual Level Analysis

The key aim of this section is to analyse the relationship between individual level performance and the various factors associated with it. The performance of the student on the ASER tools was developed by PRATHAM in India and has also been used in the many parts of the world. As per its methodology, the tests were administered one-to-one to each child individually in a process that took an average of about fifteen minutes for the Grade II and about thirty minutes for the Grade IV.

The nature of the ASER score is dichotomous indicating that the student either passes coded as '1' or failed coded as '0'. The criteria for scoring in the ASER test were set out earlier (see section 6.2). A Logistic regression model was used to explore the relationships between this dichotomous outcome variable for the measurement of the performance of the student at the individual level and a number of school related, teacher related, and students' family related factors. The details of the rationale for the logistic regression model have been discussed earlier in the chapter three.

The analysis of individual student level data was carried out in a similar manner to the school level analysis. The only difference is that the outcome variable in this analysis is of a dichotomous type, whereas the outcome variable in the school level analysis was of a continuous type. The measurement of the relationship between the individual performance as an outcome variable (pass vs. fail) and the independent factors is illustrated by the following flowchart (Figure 7-2).

Figure 7-2 Flow chart of Regression equation Individual Level



The outcome variable for this individual level analysis is a dichotomous variable. The association between the outcome variable and the independent variables (determinants of outcome) were assessed by applying the a logistic regression. The approach taken here involves starting with a simple logistic regression taking one independent variable at a time and finally using a multivariate logistic regression analysis.

The final multivariate logistic regression model is built by applying a stepwise forward selection procedure for selecting the variable in the model. The analysis was carried out separately for all of the schools (government and private) and for government schools only. The results of the multivariate analysis for Nepali, for Grade II are presented in section 7.6.1, for maths and in 7.6.2. Similarly the results of the multivariate analysis for Grade IV for Nepali and maths are explained in Sections 7.6.3 and 7.6.4 respectively.

The sign and magnitude of the coefficient associated with any explanatory variable indicates the direction and strength of the variable relationship with student performance.

The major objective of this analysis was to establish the association between different factors as independent input variables (explanatory) with students' either 'pass' or 'fail' status as an outcome variable (predicators). Keeping this objective in mind, initially, uni-variate logistic regression (taking one independent variable at a time) and then in the next stage a multivariate logistic regression as discussed in statistical methods in chapter three was adopted.

Table 7-1 provides a detailed description of the independent variable with their codes for the individual level data. The independent factors are defined under four major areas, namely, *Student related factor, School related factor, Teacher related factor* and *family factor* for each subject in each grade and in each type of school. Accordingly, the lists of predictor variables with their codes are as follows given below.

Table 7-1 List of independent variables with their codes for Individual Analysis

SN	Variable name	Details	Code
	Student related factors		
1	std_age	Student age	Number of years
2	std_sex	student sex	0 = male, 1 = female
3	std_rlgn1	Student religion	0 = hindu, 1 = non hindu
4	std_liv_w_p	Student living with parents	0 = yes, 1= no
5	std_hw_prnt	Parents help students to study at home	0 = yes, 1= no
6	std_eth1	Student's ethnicity	1 = mainstream, 2 = Janajati, 3 = Dalit
7	std_p_ltra	Student's parent literacy	0= yes, 1= no
8	std_all_book	Student has all book	0 = yes, 1= no
	School related factors (Head Teacher)		
1	ht_sex	Head Teacher sex	0 = male, 1 = female

2	ht_rxp_tot	Working as head Teacher	Number of years
3	ht_ tran	Head Teacher Training	0 = yes, 1 = no
4	ht_exp_sch	Number of years working as head teacher for this school	Number of years
5	ht_qulf	HT's qualification	1= IA, 2 = SLC, 3 = BA, 4 = MA
6	ht_tran1m	Head teacher having taken one month training	0 = yes, 1= no
	School location and facilities		
7	sch-type	School type	0= Private schools, 1= Govt.
8	Eco_regi	Geographical eco-belt	1 KTM, 2 = Terai, 3= Hill, 4= Mountain
9	School location	Geographical location	0= Urban, 1= rural
10	Std_attn	Student attendance (Head count during school visit day)	Number of students
11	st_atd_pcls	Student attendance as recorded in the school register	Number of students
12	classday	The number of days the school was open in a year	Number of days
13	str	Student teacher ratio	Number of student
14	Txt_all	All required text books availabile	0 = yes, 1= no
15	buid-typ	School building type	0 = pakki (permanent with concrete), 1 = kacchi (temporary)
16	calendr	School calendar (yearly school plan)	0 = yes, 1= no
17	nepchart	School has Nepali alphabet and letter Chart	0 = yes, 1= no
18	nepdisnry	School has Nepali language dictionary	0 = yes, 1= no
19	engdisnry	School has English dictionary	0 = yes, 1= no
20	libry_yes	Library	0 = yes, 1= no
21	comptr_yes	Computer	0 = yes, 1= no
22	watr_yes	Drinking water	0 = yes, 1= no
23	Girl_toilet	Availability of girls toilet in school	0 = yes, 1= no

List of independent variables with their codes (continued)

SN	Variable name	Details	Code
	Teacher related factors		
1	1.tch_age	Teacher age	-
2	2. tch_sex	Teacher sex	0 = male, 1 = female
3	3. tch_eth1	Teacher Ethnicity	1 = Mainstream, 2 = Janajati, 3= Dalit
4	4. tch_math_exp	Number of years of teacher experience as a maths teacher	Number of years
5	4. tch_nep_exp	Number of years of teacher as a Nepali teacher	Number of years
6	5. tch_qulf	Teacher's qualifications	1= IA, 2= SLC, 3 = BA, 4 = MA
7	6. tch_rlgn1	Teacher religion	0 = hindu, 1= non hindu
8	7. tch_house	Teacher's house in same district	0 = yes, 1= no
9	8. tch_attend	Teacher attendance each year	>=180 (0), < 180 (1)
10	Tch_math_trn	Teacher has maths teacher training	0 = yes, 1= no
11	Tch_nep_trn	Teacher has Nepali teacher training	0 = yes, 1= no
	Family related factors		
1	1. hh_incomey	Family annual income	-
2	2. hh_own_hose	Own house	0 = yes, 1= no
4	3. hh_agr_land	Agricultural land	0 = yes, 1= no
5	4. hh_help_chld	Family helps child	0 = yes, 1= no
6	5. hh_mem_abord	Work abroad	0 = yes, 1= no
7	6. hh_head_sex	Sex	0= male, 1 = female
8	7. hh_occup	Occupation	1= agri, 2= Daily Wages, 3= service, 4 = others
	ASER SCORES		
1	nep2_pp	Nepali percentage pass rate at Grade II	

2	math2_pp	Maths percentage pass rate at Grade II	
3	nep4_pp	Nepali percentage pass rate at Grade IV	
4	math4_pp	Maths percentage pass rate at Grade IV	

7.6.1 In Nepali at Grade II for all schools and Government schools

The results of the multivariate logistic regression analysis for assessing the association between the set of independent covariates with the individual performance of the students in Grade II for Nepali. As already mentioned above, a multivariate logistic regression analysis was carried out separately considering the variables from four different themes namely, student related factors, school-related factors, teacher-related factors and family-related factors. The reason for applying separate multivariate logistic regression analysis for the independent variables under the different thematic areas is that the independent variables are different for each different theme.

The final results of the multivariate logistic regression analysis are presented in Tables 7-2 and 7-3 for all of schools and government schools only. The coefficients of these regressions indicate how changes in each of the explanatory variables is associated with the probability of passing the ASER exams, assuming all other factors remain unchanged.

Table 7-2 Multivariate Logistic Regression for Nepali (Government and private) at Grade II

Variable	coef.	S. E.	p-value	95% CI
Student related factor (n = 141)				
Parents help students to study at home (std_hw_prnt)	-1.128	0.382	0.003	-1.878 - 0.379
Student religion (std_rlgn1)	-1.315	0.460	0.004	-2.218 - 0.411
Student parent literacy (std_p_litra)	-1.246	0.463	0.007	-2.153 - 0.339
constant	0.929	0.308	0.003	0.325 1.533
School related factor (n = 216)				
Nepali dictionary (nepdisnry)	-0.596	0.202	0.004	-1.196 - 0.121
Having a school calendar (calendr)	-1.113	0.329	0.001	-1.760 -0.467

School building type (build_typ)	0.980	0.435	0.025	0.126 1.833
Availability of all required textbooks (all txt books)	0.963	0.458	0.040	0.123 1.820
constant	-0.545	0.418	0.192	-1.365 0.273
Log - likelihood = -113.64, Pseudo R^2 = 0.290				
Teacher related factor (n = 242)				
Teacher ethnicity (tch_eth1):				
Janajati (Janajati)	1.208	0.370	0.001	0.481 1.930
Dalit (dalit)	1.210	0.576	0.040	0.420 1.89
Teacher Qualification (tch_qulf)				
SLC & Higher secondary Level	-0.378	0.172	0.030	-1.020 - 0.219
Bachelor in Art (BA)	-0.412	0.196	0.040	-1.11 - 0.291
Master in Art (MA)	-0.437	0.218	0.045	-1.05 -0.101
Teacher house (resident) in the same district where they teach (tch_house)	1.140	0.560	0.041	0.047 2.245
Teacher having received training (tch_train)	-0.220	0.108	0.043	- 0.754 - 0.113
constant	-0.570	0.242	0.019	-1.365 - 0.273
Log - likelihood = -151.741, Pseudo R^2 = 0.191				
Family factor (n = 98)				
Availability of agricultural land (hh_agr_land)	0.237	0.107	0.030	0.102 1.190
Family annual income (hh_m_inc)	-0.342	0.162	0.037	-1.030 - 0.170
constant	-0.450	0.418	0.284	-1.365 0.273
Log - likelihood = -55.54, Pseudo R^2 = 0.290				

Dependent variable: pass/fail status of students through ASER score

Government schools

In assessing the performance of students in Nepali at Grade II, three student-related variables [parents help students to study at home *(std_hw_prnt),* student religion *(std_rlgn1) and* student parent literacy *(std_p_litra)*] were found to be highly significant, three school-related variables [Nepali dictionary (*nepdisnry),* school calendar *(calendr),* school building type *(build_typ)*] showed to be highly significantly*, and having all required textbook (txt books*) was found to be of border-line significance, among the four teacher-related variables, teacher's ethnicity (t*ch_eth1)* was at a highly significant level however, the teacher qualification *(tch_qulf) and* teacher residence in same district *(tch_house) and* teacher training

(tch_train)] were found to be at border-line significance. The two family-related variables having [agricultural land (*hh_agr_land)* and family annual income (*hh_m_inc*)] were found to be significant predictors at the 5% level of significance.

Taking one of the significant factors, school calendar (*calendr)* i.e. a school maintaining the academic calendar or not), the odds of the students attaining a pass in Nepali at Grade II was found to be significantly less (***β*** **=** *-1.113, p= 0.001*) in those schools which were not maintaining an academic calendar, compared with those students studying in schools that maintained an academic calendar.

The regression coefficient for parents helping students to study at home *(std_hw_prnt*) was a negative Beta value (***β=*** *-1.128, p= 0.003)* indicating that the odds of the students passing in Nepali were significantly less in those students who did not get help from their parents with studying at home compared with students who did get help from their parents.

Similarly, the regression coefficient for student religion (*std_rlgn)* is a negative Beta value (***β=*** *-1.315, p= 0.004)* showing that the odds for Non-Hindu students gaining a pass in Nepali were significantly less compared with those of Hindu students. This was statistically significant.

Whether the teacher had received training *(tch_train)* showed border line association (*p= 0.043)* with pupils' performance in Nepali at Grade II at the 5% level of significance. The Beta negative coefficient (***β*** = - 0.220) relationship between the performance of student and teaching training indicated that such training was not useful in relation to student performance. Perhaps the teachers have such a very low competency level that they were unable to absorb the training skills and knowledge and were also unable to deliver and impart these skills and knowledge. Therefore, there is a need to review and redesign the training package including the approach adopted, the content and methodology.

Looking at the teacher ethnicity, the individual performance of the students having Janajati (***β*** = 1.208, p = 0.001) and Dalit (***β*** = 1.210, p = 0.040) teacher is observed to be significantly better than having mainstream teachers almost more than three times in each category.

It can be observed from the results of the multivariate logistic regression analysis that the students' parents literacy was as common a significant factor as student related factors. Types of building and availability of all required text books were the most common significant factors amongst school related factors. Teachers' qualification has emerged as one of the most common significant factors under teacher related factors. Ownership of agricultural land and household income were the most important statistically significant factors; each played a very important role in the performance of the students.

We have also undertaken the multivariate logistic regression for Nepali at Grade II for all the schools and for government schools separately for 1% level of significance and for 10% level of significance to assesses risk factors associated with the individual performance of the students. The results of the regression analysis at 1% and 10% level of significance for maths at Grade II for all schools and for government school only are shown in Annex 1.1 (a) and 1.1 (b) respectively.

The results of the logistic regression analysis for the 10% level of significance for Nepali at Grade II for all school (government and private) is also shown in Annex 1.1 (b). One additional school-related variables [building type (*build_typ*)], one additional teacher-related variable teacher house (*tch_house*) and two additional family-related variables [availability of agriculture land (*hh_agr_land*) and family annual income (*hh_m_inc*)], were all statistically significant at the 10% level of significance.

Three student-related factors [parents helping students to study at home *(std_hw_prnt),* student religion *(std_rlgn1) and* student parent literacy*(std_p_litra)*], three school-related factors, [having a Nepali dictionary (*nepdisnry),* maintaining a school calendar *(calendr),* school building type *(build_typ)*], two teacher related factors [teacher caste (*th_cast1). Similarly, the* teacher qualification *(tch_qulf)* and two family related factors, [having agricultural land (*hh_agr_land)* and family annual income *(hh_m_inc*)] were found to be statistically significant. The odds of having pass in Nepali grade II was found to be associated 2.6 (β = 0.980, p = 0.024) times higher for those pupils who study in pukki buildings (permanent building) as compared to kachhi building (temporary building).

Looking at 1% level of the significance, three student-related variables [parents help students to study at home *(std_hw_prnt),* student religion *(std_rlgn1) and* student parent literacy *(std_p_litra)*] were found to be highly significant, two school-related variables [school calendar *(calendr),*and school building type *(build_typ)*] were found to be highly significantly [see detail in Annex1.1(a)].

Table 7-3 shows the results of the multivariate logistic regression analysis for measuring the relationship between the set of independent covariates with the individual performance of the students in Grade II for Nepali in government schools only.

Table 7-3 Multivariate Logistic Regression for Nepali (government schools) at Grade II

Variable	coef.	S. E.	p-value	95% C.I.
Student factor (n = 93)				
Parents help students to study at home (std_hw_prnt)	-2.092	0.601	0.001	- 3.270 - 0.913
Student religion (std_rlgn1)	-1.823	0.629	0.004	-3.056 - 0.589
Student parent literacy (std_p_litra)	-1.230	0.590	0.037	-2.388 - 0.073
Student ethnicity (std_eth1):				
Janajati (Janajati)	-0.841	0.417	0.044	-1.659 - 0.023
Dalit (dalit)	-0.686	0.339	0.046	-1.642 - 0.025
constant	0.929	0.396	0.026	0.104 1.660
Log likelihood = -86.81, Pseudo R^2 = 0.109				
School factor (n = 124)				
Teacher Qualification (tch_qulf)				
SLC & Higher secondary Level	-0.377	0.174	0.032	-1.030 - 0.218
Bachelor in Art (BA)	-0.413	0.196	0.042	-1.120 - 0.392
Master in Art (MA)	-0.438	0.219	0.046	-1.060 - 0.242
School calendar (calendr)	-1.046	0.386	0.007	-1.803 -0.288
School building type (build_typ)	0.970	0.441	0.030	0.127 1.834
Availability of all required textbooks (all txt books)	0.953	0.350	0.003	0.122 1.720
constant	0.174	0.296	0.556	-0.405 0.754
Log likelihood = -79.014, Pseudo R^2 = 0.410				
Teacher factor (n = 140)				
Teacher ethnicity (tch_eth1):				

Janajati (Janajati)	1.211	0.350	0.001	0.482 1.930
Dalit (dalit)	1.212	0.250	0.001	0.425 1.899
Teacher Qualification (tch_qulf)				
SLC & Higher secondary Level	-0.379	0.178	0.036	-1.03 - 0.207
Bachelor in Art (BA)	-0.411	0.203	0.044	-1.130 - 0.274
Master in Art (MA)	-0.438	0.217	0.046	-1.070 - 0.323
Teacher religion (tch_rlgn1)	-2.115	0.765	0.006	-3.615 - 0.616
Teacher having received training (tch_train)	-0.330	0.160	0.041	- 0.753 - 0.219
constant	-0.523	0.223	0.019	- 0.960 - 0.086
Log likelihood = -79.389, Pseudo R^2 = 0.129				
Family factor (n = 64)				
Household occupation (hh_occup):				
Daily wages (DW)	0.117	0.058	0.047	0.090 1.525
Services (service)	1.504	0.746	0.040	0.040 2.967
Others (others)	- 0.693	0.348	0.045	-1.909 - 0.421
Family annual income (hh_m_inc)	- 0.356	0.161	0.034	-1.050 - 0.232
constant	- 0.50	0.422	0.234	-1.230 0.289
Log likelihood = -83.440, Pseudo R^2 = 0.139				

Dependent variable: pass/fail status of students through ASER score

Three student-related variables namely [parents help students to study at home *(std_hw_prnt),* student religion *(std_rlgn1), and* student parental literacy *(std_p_litra)*] were found to be highly significant. However, *the* student ethnicity *(std_eth1)*] are found to be border-line significant at the 5% level of significance with the performance of the students in the Nepali at Grade II. Likewise, four school-related factors [having a school calendar *(calendr),* school building type *(build_typ)* and having all required textbooks *(all txt books*)] and four teacher-related factors [teacher ethnicity (*tch_eth1),* teacher *religion (tch_rlgn1)*] were foudn to be highly significant, however [the teacher qualification *(tch_qulf), and* teacher having received training *(tch_train*)] showed border-line significant association with pupil performance in the Nepali at the 5% level of significance. The household monthly income (*hh_m_inc*) were shown to be significant, however the household occupation (*hh_occup*) showed at boarder-line level of significant as family related factors for pupil performance.

It is interesting to look at the student ethnicity, the individual performance of the students having Janajati (β = -0.841, p = 0.044) and Dalit (β = -0.686, p = 0.046) identify to be border line significantly not better than having mainstream students almost fifty percent less performed in each category. Therefore, this analysis suggested that there is a need to review current ethnicity-based scholarships and other benefits provided by the government authority.

A logistic regression was also carried out for Nepali at Grade II for all the schools and for government schools separately at the 1% level of significance and at 10% level of significance. The results of the regression analysis at the 1% and 10% level of significance for Nepali at Grade II for all schools and for government school only are shown in Annex 1.1 (a), 1.2 (a) and 1.1 (b), 1.2 (b) respectively.

Similarly, the results of the logistic regression analysis for the 10% level of significance for Nepali subject (Grade II) for government school is also shown in Annex 1.2 (b). In this analysis, the same student-related and same school-related variables as found in all schools (government and private) have showed considerable association with the performance of individuals in Nepali at Grade II at the 10% level of significance. One additional teacher-related variable [teacher training (*tch_train)*], and two additional family related variables [family member working abroad (*hh_mem_abord)* and helping the child at home *(hh_help_chld)*] had a significant association at the10% level of significance with student individual performance in Nepali at Grade II in government schools.

The results of the regression analysis at the 1% level of significance for Nepali subject (Grade II) for government schools only are shown in Annex 1.2 (a). Two of the same student-related factors [parents help students to study at home *(std_hw_prnt),*and student religion *(std_rlgn1)*] as in both (government and private) schools were observed to be significant at the 1% level of significance. Three school-related factors [school calendar *(calendr), availability of all required text books (all text books)* and school building type *(build_typ*)], two teacher-related factors [teacher ethnicity (*tch_eth1)* and teacher religion *(tch_rlgn1)*] were found to be statistically significant at the 1% level of significance. These variables showed very strong relationships with the individual performance of the students in Nepali at Grade II in government schools.

Perhaps the most interesting policy-related issue to emerge is that relating to government policy on teacher training. The government authority claimed that more than 80% of primary school teachers were trained. It is noteworthy that, Nepali teacher training (*tch_train*) showed border-line significant (p= 0.041) association with pupils' performance in Nepali at Grade II at the 5% level of significance in government schools. However, had a negative Beta coefficient (β = -0.330) indicating that there was no differences between trained teachers and untrained (who do not got training) teachers' performance in relation with the learning achievement of the students. This shows that the training may not be of a sufficient high quality to impact on student performance.

7.6.2 In Maths at Grade II for all schools and Government schools

The same approach of multivariate logistic regression analysis was adopted to identify the significant factors at the 5% level of significance for the performance of students in the maths at Grade II. The results of the multivariate logistic regression for Grade II maths in all schools (government and private) are shown in Table 7-4

Three factors under each theme i.e. student related factors, school related factors, teacher-related factors and family-related factors, [altogether twelve variables namely student ethnicity (*std_eth1),* student religion *(std_rlgn1),* student parent literacy (*std_p_litra)*, head teacher qualification (*ht_qulf), having a English dictionary (engdisnry),* availability of all required text books *(all txt books),* teacher qualification *(tch_qulf),* teacher house (resident) in the same district *(tch_house), teacher training (tch_train),* having agricultural land with the household *(hh_agr_land), family annual income (hh_m_inc)* and household occupation *(hh_occup*)] showed statistically significantly association at the 5% level of significance with pupil performance in maths in all (government and private) schools.

Table 7-4 Multivariate Logistic Regression for Maths (government and private) at Grade II

Variable	coef.	S. E.	p-value	95% C.I.
Student factor (n = 216)				
Student ethnicity (std_eth1):				
Janajati (Janajati)	-0.756	0.330	0.022	-1.403 - 0.108
Dalit (dalit)	0.064	0.633	0.919	-1.176 1.305

Student religion (std_rlgn1)	-0.953	0.380	0.012	-1.699 - 0.208
Student parent's literacy (std_p_litra)	-1.272	0.398	0.001	- 2.054 - 0.490
constant	0.571	0.241	0.018	0.098 1.045
Log likelihood = -132.441, Pseudo R^2 = 0.097				
School factor (n = 246)				
Teacher Qualification (tch_qulf)				
School Leaving certificate (SLC) & Higher secondary Level	-0.390	0.184	0.034	- 1.090 - 0.230
Bachelor in Art (BA)	-0.451	0.222	0.044	-1.110 - 0.321
Master in Art (MA)	-0.458	0.223	0.041	-1.090 - 0.142
English dictionary (engdisnry)	-1.302	0.513	0.011	- 2.308 - 0.296
Availability of all required text books (all txt books)	0.853	0.352	0.016	0.127 1.920
constant	-0.384	0.229	0.093	- 0.833 0.064
Log likelihood = -148.649, Pseudo R^2 = 0.118				
Teacher factor (n = 242)				
Teacher Qualification (tch_qulf)				
SLC & Higher secondary Level	-0.371	0.170	0.031	-1.021 - 0.213
Bachelor in Art (BA)	-0.456	0.217	0.040	-1.120 - 0.340
Master in Art (MA)	-0.436	0.216	0.046	-1.007 - 0.128
Teacher house (resident) in the same district (tch_house)	3.741	1.02	0.001	1.725 5.757
Teacher received training (tch_train)	-0.350	0.172	0.043	- 0.713 - 0.124
constant	-0.483	0.140	0.001	-0.758 - 0.108
Log likelihood = -147.196, Pseudo R^2 = 0.115				
Family factor (n = 98)				
Household having agricultural land (hh_agr_land)	0.237	0.110	0.034	0.122 1.190
Family annual income (hh_m_inc)	-0.342	0.156	0.031	-1.03 - 0.230
Household occupation (hh_occup):				
Daily wages (DW)	0.112	0.054	0.042	0.021 1.527
Services (service)	1.514	0.716	0.031	0.045 2.966
Others (others)	-0.683	0.334	0.044	-1.919 - 0.328
constant	-0.53	0.431	0.264	-1.231 0.276
Log likelihood = -83.440, Pseudo R^2 = 0.157				

Dependent variable: pass/fail status of students through ASER score

We have also attempted the multivariate logistic regression for maths at Grade II for all the schools and for government schools separately for the 1% level of significance and for the 10% level. The results of these regression analyses are shown in Annex 1.3 (a). 1.4 (a) and 1.3 (b) 1.4 (b) respectively.

Only one teacher-related factors namely teacher age (*tch_age*) and availability of library (*libry_yes*) and student ethnicity (*std_eth1*) explained the performance strongly at the 1% level of significance. Some additional variables such as student sex (*std_sex*), availability of the all of the required text books (*all txt books*), having school calendar (*calendar*),student parent literacy (std_p_litra), and parents help students to study at home *(std_hw_prnt*) were found to be significantly associated at the 10% level of significance with the performance of students in maths in all school (government and private) and government schools.

The same student-related factors and same three family related factors which were significant at the 5% level of significance are also showed strong association with student performance in maths at the 1% level of significance (see Annex 1.3 (a).

Table 7-5 Multivariate Logistic Regression for Maths (government) at Grade II

Variable	coef.	S. E.	p-value	95% C.I.
Student factor (n = 168)				
Student parent literacy (std_p_litra)	-1.189	0.471	0.012	-2.113 - 0.265
Student ethnicity (std_eth1):				
Janajati (Janajati)	-1.089	0.380	0.004	-1.835 - 0.344
Dalit (dalit)	0.170	0.578	0.769	-0.962 1.304
constant	0.041	0.304	0.893	-0.556 0.638
Log likelihood = -96.529, Pseudo R^2 = 0.178				
School factor (n = 154)				
Library in school (libry_yes)	-1.129	0.353	0.001	-1.821 - 0.437
Head Teacher age (ht_age)	0.073	0.035	0.039	0.003 0.144
Availability of required textbooks (all txt books)	0.653	0.312	0.041	0.117 1.989
constant	-0.084	0.237	0.722	-0.550 0.381
Log likelihood = -93.800, Pseudo R^2 = 0.538				

Teacher factor (n = 170)				
Teacher Age (tch_age)	0.058	0.016	0.001	0.025 0.092
Teacher year of experience (tch_exp)	-0.047	0.018	0.012	-0.156 - 0.020
Teacher Qualification (tch_qulf)				
SLC & Higher secondary Level	-0.341	0.155	0.033	-1.011 - 0.109
Bachelor in Art (BA)	-0.422	0.204	0.041	-1.130 - 0.321
Master in Art (MA)	-0.426	0.208	0.043	-1.217 - 0.122
Teacher received training (tch_train)	-0.450	0.210	0.033	- 0.712 - 0.312
constant	-2.707	0.608	0.001	-3.900 - 1.514
Log likelihood = -100.493, Pseudo R^2 = 0.160				
Family factors (n = 61)				
Household having agricultural land (hh_agr_land)	-1.522	0.616	0.014	-2.731 - 0.313
Family annual income (hh_m_inc)	-0.142	0.064	0.032	-1.050 - 0.013
constant	0.510	0.516	0.323	-0.501 1.522
Log likelihood = -36.681, Pseudo R^2 = 0.180				

Dependent variable: pass/fail status of students through ASER score

The results of multivariate logistic regression model for government school for maths at Grade II, is portrayed in Table 7-5. Only two student-factors [student parental literacy (*std_p_litra) and* student ethnicity *(std_eth1)*] and three school-related factors [library (*libry_yes),* head teacher age *(ht_age)* and all of the required text books available *(all txt books*], teacher-related factors teacher age (*tch_age*), teacher's years of experiences (*tch_exp*) and teacher having already received training (*tch_train*), and family-related factors such as: household having agriculture land (*hh_agr_land*) and family annual income (*hh_m_inc*) explained the statistically significant association at the 5% level of significance with pupils' individual performance in maths at Grade II in government schools.

Two factors-student [student ethnicity caste (*std_eth1) and* the availability of all required text books *(all txt books)*] were seen to be common in all schools as well as in government schools for the students' performance in maths at Grade II.

As expected, the individual performance of students studying in those schools not having a library is found to be considerably worse (β = -1.129, p = 0.001) than those students' performance who were studying in schools having library facilities. It

clearly shows that the authorities need to give more attention to the arrangements for necessary school libraries.

Four teacher-related factors [teacher age *(tch_age),* teacher years of experience *(tch_exp,)* teacher qualification *(tch_qulf) and* teacher training *(tch_train)*] and two family-related factors [household agricultural land (*hh_agr_land)* and family annual income *(hh_m_inc*)] had a significant effect on the pass/fail status of the students in maths at Grade II in government schools. Two teacher-related factors [teacher training *(tch_train)* and teacher qualification *(tch_qulf)*] and two family-related factors [household agricultural land (*hh_agr_land)* and family annual income *(hh_m_inc*)] were observed to be common predictors in all schools as well as in government schools for the students' performance in maths at Grade II.

As implemented above, the multivariate logistic regression model was run at 1% level of significance and 10% level of significance separately under this consideration also. The number of significant variables selected through the model at the 1% level of significance is expectedly less as compared with those selected at 5% level of significance (see Annex 1.3 (a) and 1.4 (a) for detail). Some few additional variables have come out statistically significant at the 10% level of significance; the detail results including regression coefficient with p-value and confidence interval are shown in Annex- 1.3 (b) and 1.4 (b) .

7.6.3 In Nepali at Grade IV for all schools and Government schools

Table 7-6 describes the results of a multivariate logistic regression analysis with regression coefficients at Grade IV Nepali in all (government and private) schools. The results showed that student parental literacy (*std_p_litra*) is again, one of the important determinants among the student related factors at the 5% level of significance. The regression coefficient for student parental literacy (*std_p_litra*) was β = -1.346, p = 0.002) which indicates that the performance of the students whose parents were not illiterate was almost 74% poorer compared to those students whose parents were literate.

Table 7-6 Multivariate Logistic Regression for Nepali (government and private) at Grade IV

Variable	coef.	S. E.	p-value	95% C.I.
Student factor (n = 235)				
Student ethnicity (std_eth1):				
Janajati (Janajati)	-1.189	0.310	0.001	-2.105 - 0.349
Dalit (dalit)	0.160	0.080	0.046	0.112 1.204
Student parent literacy (std_p_litra)	-1.346	0.433	0.002	-2.143 - 0.639
constant	0.477	0.238	0.046	0.198 0.756
Log likelihood = -157.014, Pseudo R^2 = 0.280				
School factor (n = 229)				
Availability of Library (libry_yes)	-0.466	0.226	0.041	-0.990 - 0.017
Availability of required textbooks (all txt books)	0.853	0.350	0.015	0.132 1.920
constant	0.645	0.320	0.045	0.276 1.014
Log likelihood = -157.64, Pseudo R^2 = 0.189				
Teacher factor (n = 170)				
tch_sex	0.900	0.294	0.002	0.323 1.478
Teacher Qualification (tch_qulf)				
SLC & Higher secondary Level	-0.241	0.112	0.034	-1.012 - 0.120
Bachelor in Art (BA)	-0.423	0.206	0.042	-1.14 - 0.302
Master in Art (MA)	-0.425	0.205	0.040	- 1.216 - 0.211
Teacher attendance over the year (tch_attend)	-0.990	0.354	0.005	-1.685 - 0.294
Teacher training (tch_train)	-0.470	0.211	0.027	- 0.711 - 0.142
constant	-0.048	0.178	0.788	- 0.398 0.302
Log likelihood = -112.493, Pseudo R^2 = 0.19				
Family factor (n = 95)				
Household having agricultural land (hh_agr_land)	-1.422	0.612	0.022	- 2.531 - 0.319
Household member working abroad (hh_mem_abord)	0.797	0.396	0.047	0.246 1.341
constant	-0.002	0.417	0.995	-0.821 1.816
Log likelihood = -56.641, Pseudo R^2 = 0.142				

Dependent variable: pass/fail status of students through ASER score

This variable set out in the table have been shown to have a significant association with outcome, not only on students' performance in the Nepali subject at Grade IV but also with the performance of students in Nepali as well as in the maths at Grade II. Two school-related factors [having a library in the school (*libry_yes)* and availability of required text books *(all txt books)*], *and* four teacher-related factors [teacher sex(*tch_sex),* teacher *qualification (tch_qulf),* teacher attendance over the year *(tch_attend) and* teacher training status *(tch_train)*] showed a significant association (at 5% level of significance) with pupil performance in the Nepali subject at Grade IV in all schools.

It is interesting to note that the school having a library was found to be statistically significant (p = 0.041) at the 5% level of significance, however the negative Beta coefficient (β = - 0.466) showed there was no benefit of having a library at school. There could be several reasons for this. During the field visit myself and research associate observed that, those schools having a library the student do not have access or there may not be a proper mechanisms to ensure the children can use it properly. By contrast a student having all required textbooks makes a significant difference in learning achievement (β = 0.853, p=0.015) at the 5% level of significance.

A new variable, namely, a households member working abroad (*hh_mem_abord)* was only just significant (β = 0.797, p = 0.047) at the 5% level of significance. This indicates that the odds of students passing in Nepali at Grade IV in all of the schools is significantly higher in those students whose family member(s) did not go abroad, compared with those students whose family member(s) were abroad. In contrast, having agricultural land in the household was found to be statistically significant at the 5% level (p=0.022), but with a the negative Beta coefficient (β = - 1.422) showing that having agricultural land may have a negative impact on student performance.

- Government school

The results of the multivariate logistic regression for Grade IV Nepali in government schools is presented in Table 7-8. The same two factors related to students' learning outcomes were found to be significant at the 5% level of significance for the Nepali at Grade IV in government schools as in all schools (government and private). The magnitude of the regression coefficients for these two student-related factors namely [student parent literacy (*std_p_litra) and* student ethnicity *(std_eth1)*] were found to be more or less the same in all schools (government and private) and in government schools only. Two school-related factors [having a school calendar *(calendr*), a school library *(libry_yes)* and availability of required textbooks *(all txtbooks)*] were both statistically significant.

Having a school calendar had a p-value (0.004) but the negative Beta coefficient (*β* = - 0.466) showed there was a negative relationship between having a library at school and student performance. Three teacher-related factors [teacher attendance (*tch_attend),* teacher qualifications *(tch_qulf) and teacher training (tch_train)*] showed association with pupils' performance in Nepali at Grade IV at the 5% level of significance in government schools. The regression coefficient for teacher attendance during the year (having less than 180 days attendance vs. having more than 180 days in a year) was found to be *β* = -0.990, p=0.005 which indicates that the performance of the students whose teacher's attendance was less than 180 days was almost 63% less compared to those students whose teachers' attendance were more than 180 days. This result was significant at the 5% level of significance. This finding clearly suggests that schools should focus on ensuring that teachers attend regularly.

Perhaps the most interesting policy-related finding was the Beta negative coefficient (*β*= -0.470) between student performance and teacher training. This indicates that such training is not effective in impacting on student performance.

We also undertook a multivariate logistic regression for Nepali at Grade IV for all of the schools and for government schools separately at the 1% and 10% levels of significance. The results of these logistic regressions are in Annex 1.5 (a), 1.6 (a) and 1.5 (b), 1.6 (b) respectively.

Table 7-7 Multivariate Logistic Regression for Nepali (government) at Grade IV

Variable	coef.	S. E.	p-value	95% C.I.
Student factor (n = 167)				
Student parent literacy (std_p_litra)	-1.345	0.431	0.002	-2.133 - 0.638
Student ethnicity (std_eth1):				
Janajati (Janajati)	-1.289	0.310	0.001	-1.431 - 0.349
Dalit (dalit)	0.160	0.077	0.040	0.121 1.704
constant	0.377	0.143	0.009	0.191 0.759
Log likelihood = -141.014, Pseudo R^2 = 0.380				
School factor (n = 143)				
Having a school calendar (calendr)	-1.043	0.356	0.004	-1.503 - 0.289
Availability of Library (libry_yes)	-1.127	0.343	0.001	-1.421 - 0.637
Availability of required textbooks (all txt books)	0.863	0.340	0.012	0.120 1.920
constant	-0.798	0.403	0.050	-1.61 0 - 0 .013
Log likelihood = -93.160, Pseudo R^2 = 0.380				
Teacher factor (n = 168)				
Teacher attendance each year (tch_attend)	-0.990	0.354	0.005	-1.685 - 0.294
Teacher Qualification (tch_qulf)				
SLC & Higher secondary Level	-0.241	0.114	0.036	-1.012 - 0.120
Bachelor in Art (BA)	-0.423	0.206	0.042	-1.14 - 0.132
Master in Art (MA)	-0.425	0.205	0.040	-1.216 - 0.229
Teacher received training (tch_train)	-0.470	0.211	0.027	- 0.711 - 0.241
constant	-0.048	0.178	0.788	- 0.398 0.302
Log likelihood = -108.423, Pseudo R^2 = 0.192				
Family factor (n = 63)				
Household having agricultural land (hh_agr_land)	-1.422	0.612	0.023	-2.531 - 0.319
Family annual income (hh_m_inc)	-0.342	0.154	0.031	-1.03 - 0.170
constant	0.496	0.338	0.143	-0.167 1.160
Log likelihood = -59.541, Pseudo R^2 = 0.152				

Dependent variable: pass/fail status of students through ASER score

The multivariate logistic regression model was run at the 1% and 10% level of significance showed some additional variables were statistically significant at the 10% level of significance. The detailed results including regression coefficient with p-value and confidence interval are shown in Annex at the 1% and 10% levels of significance. The results of these logistic regressions are in Annex 1.5 (a),1.6 (b) and 1.5 (b), 1.6(b) respectively.

At the 10% significance level along with the predictors coming out significant at the 5% level of significance, some additional predictors such as [student sex (*std_sex),* household member support to children *(hh_help_chld)*] were found to be significantly related with individual performance of the student in this subject which is shown in Annex 2.5 (a), 2.6 (a), 2.3 (b), 2.4 (b).

At the 1% significance level of analysis, two student-related factors: student ethnicity (*std-eth1*) and student parent literacy (*std-p_litra*), and two teacher related variables: teacher's sex (*tch_sex), and* teacher's attendance *(tch_attend)*] *were* statistically significantly associated with the student performance in Nepali at Grade IV in all (government and private) schools.

7.6.4 In Maths at Grade IV for all schools and Government schools

Table 7-8 shows the results of a multivariate logistic regression analysis with regression coefficients in maths at Grade IV in all (government and private) schools.

- All of the schools (government and private)

Their results show that student parent literacy (*std_p_litra)* was a common, important determinant among the student related factors at the 5% level of significance in both types of schools. Two school-related factors [school building type (*build_typ)* and having all of the required textbooks *(all txt book)*] were also common significant factors at the 5% level of significance for all schools and for government schools only for the maths at Grade IV.

Two teacher-related factors [teacher resident house in the same district (*tch_house)* and, teacher qualification *(tch_qul)*] were also common significant factors at the 5% level of significance with pupil performance in maths at Grade IV in all schools and in government schools only.

No single factor related to the family has reached significance at the 5% level of significance with the pupil performance in maths at Grade IV in all schools (government and private). However, three family related factors were significant at the 5% level of significance in association with student performances in government schools.

Table 7-8 Multivariate Logistic Regression for Maths (government and private) at Grade IV

Variable	coef.	S. E.	p-value	95% C.I.
Student factor (n = 235)				
Student ethnicity (std_eth1):				
Janajati (Janajati)	-1.119	0.245	0.001	-1.131 - 0.359
Dalit (dalit)	0.120	0.060	0.046	0.012 1.804
Student parent literacy (std_p_litra)	-1.236	0.430	0.004	-2.123 - 0.839
constant	0.377	0.142	0.008	0.188 0.956
Log likelihood = -154.234, Pseudo R^2 = 0.391				
School factor (n = 223)				
Nepali dictionary (nepdisnry)	-2.684	1.028	0.009	-4.699 - 0.669
School building type (build_typ)	0.880	0.411	0.033	0.120 1.934
Availability of required textbooks (all txt books)	0.753	0.340	0.027	0.121 1.820
constant	-1.458	0.486	0.003	-1.855 -1.021
Log likelihood = 124.651, Pseudo R^2 = 0.423				
Teacher factor (n = 212)				
Teacher Qualification (tch_qulf)				
SLC & Higher secondary Level	-0.141	0.064	0.030	-1.010 - 0.019
Bachelor in Art (BA)	-0.222	0.101	0.031	-1.12 - 0.102
Master in Art (MA)	-0.326	0.155	0.040	-1.117 - 0.129
Teacher house (resident) in the same district (tch_house)	2.741	1.02	0.007	1.525 6.707
Teacher ethnicity (tch_eth1):				
Janajati (Janajati)	1.311	0.250	0.001	0.483 1.939
Dalit (dalit)	1.112	0.350	0.002	0.425 1.990
constant	-1.707	0.508	0.001	- 4.900 - 0.814
Log likelihood =-104.290 , Pseudo R^2 = 0.432				

Dependent variable: pass/fail status of students through ASER score

- Government schools

Table 7-9 shows the results of a multivariate logistic regression analysis with regression coefficients for Grade IV in maths subject for government schools only.

[Student parental literacy (*std_p_litra*), student ethnicity *(std_eth1*), school building *(build_type*) and having school calendar (*claendr*) and availability of all required text books (*all txt books*)] were found to be statistically significant in association with student performance.

Furthermore, it is interesting to note that the teacher related variables teacher qualification (*tch_qulf*) was found to be statistically significantly associated with student performance, however all of the Beta value were found to be negative. Similarly, teacher's years of experience (*tch_exp*) and teacher being resident in the same district (*tch_house*) were found to be statistically significantly associated with student performance. This suggests that high qualification of the teachers do not necessarily produce better results for the students.

Moreover, the family related determinants family-related factor [the household having agricultural land *(hh_agr_land)* and family annual income *(hh_m_inc)* and household member working abroad *(hh_mem_abord)*] were significant at the 5% level of significance in association with student performances.

Table 7-9 Multivariate Logistic Regression for Maths subject (government) at Grade IV

Variable	coef.	S. E.	p-value	95% C.I.
Student factor (n = 167)				
Student parent literacy (std_p_litra)	-1.236	0.430	0.005	-2.123 - 0.839
Student ethnicity (std_eth1):				
Janajati (Janajati)	-1.109	0.369	0.003	-1.141 - 0.358
Dalit (dalit)	0.140	0.070	0.047	0.110 1.904
constant	0.277	0.139	0.049	0.182 0.976
Log likelihood = - 142.325, Pseudo R^2 = 0.412				
School factor (n = 161)				
School building type (buid_type)	2.838	1.050	0.007	0.780 4.896
Having school calendar (calendr)	-1.143	0.256	0.001	-1.403 - 0.269

Availability of required textbooks (all txt books)	0.653	0.240	0.007	0.1114 1.620
constant	-5.66	1.228	0.001	-8.078 - 3.260
Log likelihood = - 43.072, Pseudo R^2 = 0.2011				
Teacher factor (n = 178)				
Teacher's years of experience (tch_exp)	0.059	0.028	0.034	0.004 0.115
Teacher resident in the same district (tch_house)	2.541	1.021	0.013	1.125 5.707
Teacher Qualification (tch_qulf)				
SLC & Higher secondary Level	-0.241	0.109	0.030	-1.110 - 0.120
Bachelor in Art (BA)	-0.322	0.146	0.030	-1.120 - 0.121
Master in Art (MA)	-0.426	0.202	0.040	-1.114 - 0.213
Teacher training (tch_train)	-0.570	0.211	0.007	- 0.711 - 0.307
constant	-3.921	0.760	0.001	-5.412 - 2.430
Log likelihood = - 47.567, Pseudo R^2 = 0.213				
Family factor (n = 54)				
Household having agricultural land (hh_agr_land)	-1.322	0.612	0.035	- 2.131 - 0.319
Family annual income (hh_m_inc)	-0.342	0.152	0.030	-1.03 - 0.211
Household member working in abroad (hh_mem_abord)	0.697	0.333	0.041	0.146 1.841
constant	-0.002	0.417	0.995	-1.821 1.216
Log likelihood = - 38.107, Pseudo R^2 = 0.158				

Dependent variable: pass/fail status of students through ASER score

The results of multivariate regression analysis at the 1% and at 10% level of significance in Maths (Grade IV) are given in the Annex 1.7 (a), 1.8 (a) and Annex 1.7 (b), 1.8 (b) respectively.

At the 10% significance level of analysis, along with the predictors coming out significant at the 5% level of significance, some additional predictors such as [student sex (*std_sex),* school building type *building type (build_typ),*availability of drinking water *(watr_yes),*teacher's years of experience *(tch_exp),*family annual income *(hh_incomey) and* household member support to children *(hh_help_chld)*] were found to be significantly related with individual performance of the student (see Annex 1.7 (a) and 1.8 (a).

At the 1% significance level of analysis, the results show that the parental literacy (*std_p_litra)* was a common important determinant among the student related factors at the 5% level of significance as well as in 1% level of significance in both types of schools (see Annex 1.7 (b) and 1.8 (b).

Two school-related factors [type of building (*build_typ) and the availability of all required text books (txt books)*] were also common significant factors at the 5% level of significance for all schools and for government schools only for Maths grade IV.

However the variable having a Nepali dictionary (*nepdisnry)* showed a strong association with the outcome at Grade IV) all schools (government and private) and having a school calendar (*calendr)* at the 1% level of significance in maths at Grade IV in government school.

Two teacher-related factors [the teacher resident in the same district (*tch_house) and, teacher qualification (tch_qulf)*] were also common significant factors at the 1% as well as at the 5% level of significance with pupil performance in maths at Grade IV in all schools and in government schools respectively. Not single factor related to the family was significant either at the 1% or at 5% level of significance.

7.6.5 Summary and conclusion in Student level analysis

In order to address the third research question on whether school, teacher, student and family background factors are significantly associated with students' performance a logistic regression model was applied as the nature of the outcome variable was dichotomous (pass vs. fail based in ASER score). A separate logistic regression was undertaken with the independent predictors for each thematic for each grade, subject and for each school type i.e. all schools (government and private) and government schools.

The analysis of the multivariate logistic regression showed that parents' literacy was one of the most common highly significant factors associated with students' performance in each grade and in each subject Nepali or maths. However, other student related factors such as religion, *caste* and parents helping students to study

at home were also found to be important in relation to the individual performance of the students.

Regarding school-related factors, no single independent variable consistently reached significance. However, the variables [*qualification of the head teacher*, *availability of all required text books*, *availability of dictionaries*, *maintaining the academic calendar* and type of *building*] were identified as statistically significant predictors of the individual performance of the students.

Teacher qualification was found to be a statistically significant factor among the teacher related factors in each subject and in each grade. However, other factors such as [*teacher caste*, *teacher sex, age* and *teacher experience*] also showed some association with the students' performance. There are some family related factors such as the income of the household, agricultural land that they have, types of occupation of the family member(s) of the students were found to be statistically significant predictors among the family related factors for the performance of the students at the individual level.

7.7 Analysis of R^2 value at school level and student level

As discussed earlier, the value of R^2 explains the goodness of fit of the regression model. The higher the value of R^2 in the regression model, the better the fit. R^2 gives the proportion of variation in the dependent variable which is explained by variations in independent variables through the regression model. The higher the value of R^2 the better although a small value of R^2 can also be important and depends in part on the sample size. Table 7-10 shows the results of the summary of Pseudo R^2 value at Student Level Analysis.

Table 7-10 Summary of Pseudo R^2 value at Student Level Analysis

Types of School/ the value of R^2	Grade II		Grade IV	
	Nepali	Maths	Nepali	Maths
All Schools	0.290	0.157	0.142	0.432
Government Schools	0.139	0.180	0.152	0.158

An adjusted R^2 value ranged from 0.132 to 0.450 for the school level data, and 0.139 to 0.432 at the individual level. The best fit were achieved at the school level of analysis in relation to Grade IV in government schools. However, lower level of explanation of variance can also be important. For instance in the international literature the adjusted R^2 in Woβssman (2000), for example range from 0.18 to 0.22 only. Similarly the regression analyzing the achievement of Grade V in EDSC (1999) in Nepal had adjusted R^2 values in the range of 0.20 to 0.33.

Most of the results obtained from the current school level and individual level estimation employing OLS and Logistic regression are robust in the associations between explanatory and predictor variables as they are to student performance. The results obtained for both levels were quite consistent, in the coefficients that were significant. However some factors were not significant or even in the opposite direction to earlier research.

One explanation for these differences in the significance of the coefficients is using either *pass* or *fail* status of students as the dependent variable instead of a continuous scale variable representing the score in the ASER test. The outcome either *pass* coded as '1' or *fail* coded as '0' is a dichotomous variable. There is therefore less variability in the dependent variable when using this indicator of performance as the outcome variable. This low level of variability in the dependent variable means that it is unlikely to reveal some of the relationships that exist between the explanatory variables and student performance. However, this is the most commonly adopted approach using the ASER data.

The relatively low levels of R^2 in this study, might also because of the small sample size. Also the study might not be able to capture the extraneous variables which might be genuinely influencing the outcome variable. In order to generalize and to increase the value of R^2, another study with a sufficient large sample size including other extraneous predicting variables needs to be undertaken.

7.8 Overall summary of Regression Analysis

The primary goal of this section is to summarise the analysis of students' performance at school at an individual level and the determinant factors associated with school input variables. This should provide evidence to assist in reforming and

further improving existing education policy in a way that addresses emerging challenges and issues. It will highlight and illuminate the theoretical debate about the determinant factors associated with learning outcomes in low income countries particularly in Nepal. From the key findings, issues have emerged which can take the form of policy recommendations. Key findings which impact on policy implication and make a significant contribution to new knowledge have been identified in three main areas. These are set out in the following section.

A number of determinant factors were chosen from the four thematic areas (school, student, teacher and family related factors) that predict and contribute to the students' learning achievement. The findings and conclusions of this study are to some extent consistent and in line with existing national and international studies.

The Education Production Function (EPF) was adopted for the rigorous analysis of the data. A robust statistical model, an OLS and logistic regression (univariate and multivariate) were employed at confidence levels 90%, 95% and 99%.

As per the nature of the data, at the individual pupil level, the outcome variable was dichotomous either pass or fail, based on the ASER score. In this case, logistic regression was applied in order to assess the factors associated with student performance in Nepali and in maths at Grades II and IV of the students in the study. Different factors were associated with student performance. As mentioned earlier, these factors were broadly classified into four thematic areas. The size of the sample (for predictor variables) varied among the different factors; so logistic regression models (univariate and multivariate) were run separately for each.

For the selection of variables in the regression model, the following statistical approach was adopted. Univariate and multivariate regression analyses were carried out for each regression model. All possible explanatory variables were analyzed in a univariate regression analysis. Those variables which were significant ($p< 0.25$) in the univariate analysis were taken as candidate variables for the next stage, the multivariate regression analysis. Using these candidate variables, multivariate regression analyses were carried out at different significance levels separately i.e. at the 1%, 5% and 10% level of significance. Those variables which finally emerged as significant at the 1% level of significance in the multivariate regression model were assumed to be the final predictors for the 1% level of

significance in the multivariate regression analysis. This approach was replicated for the 5% and 10% levels of significance for the construction of final multivariate regression model.

As expected the results from the univariate and multivariate analyses and the descriptive statistics reveal that the vast majority of private and public school students obtaining better results when they study in permanent, concrete buildings (Pukki) schools. There are marked differences in performance between students studying in schools with good physical infrastructure (Pukki) as opposed to non-Pukki schools.

However facilities such as desks, tables computers, libraries and instructional materials (maps, charts, dictionaries) are unimportant input factors in explaining differences in performance among students. Firstly, the quantity and amount of these materials available in schools were not clearly established and secondly, whether or not these facilities were used by teachers during the teaching and learning activities in the class is unknown as is whether the students had access to those resources if they were available. This suggests that input variables may not be good indicators of all of the essential physical facilities in the schools.

It is equally interesting to note the descriptive statistics regarding the teacher inputs. The academic qualifications, students whose teachers had higher qualification and had undergone a full training package did not significantly better performance in their students than other groups. Although the training providing government agency National Centre for Education Development (NCED) claims the training packages to be of high quality in terms of content, the results of this study have clearly demonstrated a negative association between training and student performance. This indicates that the existing approach to teacher training does not seem to be delivering the desired result. One of the reasons for this could be the inability of teachers to translate knowledge into practice.

The number of independent predictors under the four themes (i.e. student related, teacher related, school related and family related) under consideration are, indeed, associated with student performance. However it is not possible to draw firm conclusions regarding the relationship between any single factor and student

performance without controlling for the influence of other intervening factors. As mentioned earlier, this study has used multiple regression methods to account for other intervening factors in analyzing the relationship between student performance and the various determinants. The paragraph below is a synopsis of the main findings of the regression analyses.

Among more than thirty-five independent predictors from the different themes mentioned above, only 13 have a statistically significant (at the level of 10%, 5% and 1%) relationship with the aggregate ASER scores. There are a few variables in regard to this relationship that continue to remain statistically significant in the ASER scores at the individual level.

With regard to the individual level data, when variables are ranked according to their relative impacts on performance, all school related factors are ranked in the first ten. These variables are: [student teacher ratio (*str*), the number of days that the school is open (*classday*) and the numbers years of teaching for maths teachers, and student attendance]. These findings indicate that non-school factors are less important than school factors in determining the performance of student in the ASER test. This study suggests that only school related factors play an important role in determining a student's learning outcomes.

The summary Table 7-11 shows the factors that have statistically significant relationships with school performance in both Nepali and maths at Grade II and Grade IV for all (government and private) schools and government schools only.

Table- 7-11 Summary Synopsis of Key Factors associated with Learning Outcomes at Individual Level Analysis

Variables	Nepali Grade II		Maths Grade II		Nepali Grade IV		Maths Grade IV	
	All	Gov	All	Gov	All	Gov	All	Gov
Student parent literacy (std_p_litra)	*(-)	* (-)	* (-)	* (-)	* (+)	* (-)	* (-)	* (-)
Parents help students to study at home (std_hw_prnt)	* (-)	* (-)	* (+)	-	-	-	* (+)	* (+)
Student religion	* (-)	* (-)	* (-)	-	-	-	-	-

(std_rlgn1)								
Student ethnicity (std_eth1):								
Janajati (Janajati)	-	* (-)	* (-)	* (-)	* (-)	* (-)	* (-)	* (-)
Dalit (dalit)	-	* (-)	* (+)	* (+)	* (+)	* (+)	* (+)	* (+)
Nepali dictionary (nepdisnry)	* (-)	* (-)	* (-)	NA	* (-)	* (-)	* (-)	NA
Having a school calendar (calendr)	NA	NA	* (-)	* (-)	NA	NA	* (-)	* (-)
Availability of Library (libry_yes)	-	-	NA	* (+)	* (-)	* (-)	NA	NA
Availability of required textbooks (all txt books)	* (+)	* (+)	* (+)	* (+)	* (+)	* (+)	* (+)	* (+)
School building type (build_typ)	* (+)	* (+)	-	-	NA	NA	* (+)	* (+)
Teacher ethnicity (tch_eth1):								
Janajati (Janajati)	* (+)	* (+)	-	-	-	-	* (+)	* (+)
Dalit (dalit)	* (+)	* (+)	-	-	-	-	* (+)	-
Teacher Qualification (tch_qulf)								
SLC & Higher secondary Level	* (-)	* (-)	* (-)	* (-)	* (-)	* (-)	* (-)	* (-)
Bachelor in Art (BA)	* (-)	* (-)	* (-)	* (-)	* (-)	* (-)	* (-)	* (-)
Master in Art (MA)	* (-)	* (-)	* (-)	* (-)	* (-)	* (-)	* (-)	* (-)
Teacher received training (tch_train)	* (-)	* (-)	-	* (-)	* (-)	* (-)	-	* (-)
Teacher attendance each	-	-	-	-	* (-)	* (-)	-	-

year (tch_attend)								
Teacher years of experience	-	-	-	* (-)	-	-	-	* (+)
Teacher house (resident) in the same district where he teach (tch_house)	* (+)	-	* (-)	-	-	-	* (+)	* (+)
Household having agricultural land (hh_agr_land)	* (+)	-	* (+)	* (-)	* (-)	* (-)	* (-)	* (-)
Family annual income (hh_m_inc)	* (-)	* (-)	* (-)	* (-)	-	* (-)	-	* (-)
Working abroad	-	-	-	-	* (+)	-	-	* (+)
Household occupation (hh_occup):								
Daily wages (DW)	* (+)	* (+)	-	-	-	-	-	-
Services (service)	* (+)	* (+)	-	-	-	-	-	-
Others (others)	* (-)	* (-)	-	-	-	-	-	-

The table above shows that the variables Student parent literacy (std_p_litra), student ethnicity, availability of text books, school building types, teacher ethnicity, teacher house (resident) in the same district where he teach, family member working abroad and household having agricultural land are common variables (significant at 5% level of significance) for each grade and for each subject. Interestingly, the coefficient for student teacher ratio (*str)* is negative for both Nepali and maths at Grade II, whereas the coefficient is positive at Grade IV.

The reason for this contradictory relationship is not known. It might be because of the small sample size at school level. With this sample size for school level analysis, it is difficult to generalize the results. Future research should be carried out from the same perspective but with a large enough sample size to give power to the statistical analysis.

The following Table 7-12 provides a summary of the factors which are statistically significant at different levels based on the application of OLS regression of school level data. The direction of their relationship with performance is indicated in parentheses. Note that there are a number of significant factors in the four categories shown in the below table. The entries in the table are self-explanatory.

Table 7-12 Summary Synopsis Table by using Null Hypothesis at Individual Level

Variables	Nepali Grade II		Maths Grade II		Nepali Grade IV		Maths Grade IV	
	All	Gov	All	Gov	All	Gov	All	Gov
Student parent literacy (std_p_litra)	SE	SE	SE	ME	-	SE	SE	SE
Parents help students to study at home (std_hw_prnt)	SE	SE	-	-	-	-	-	-
Student religion (std_rlgn1)	NE	SE	ME	-	-	-	-	-
Student ethnicity (std_eth1):								
Janajati (Janajati)	-	ME	ME	SE	SE	SE	SE	SE
Dalit (dalit)	-	ME	NE	NE	WE	ME	WE	ME
Nepali dictionary (nepdisnry)	SE	-	* (-)	-	-	-	SE	NA
Having a school calendar (calendr)	SE	SE	-	-	-	SE	-	SE
Availability of Library (libry_yes)	-	-	-	SE	ME	SE	-	-
Availability of required textbooks (all txt books)	ME	ME	ME	ME	ME	ME	ME	SE
School building type (build_typ)	ME	ME	-	-	-	-	ME	SE
Teacher ethnicity (tch_eth1):								
Janajati (Janajati)	SE	SE	-	-	-	-	SE	-
Dalit (dalit)	ME	ME	-	-	-	-	ME	-

Teacher Qualification (tch_qulf)								
SLC & Higher secondary Level	ME	ME	ME	ME	ME	ME	ME	ME
Bachelor in Art (BA)	ME	ME	ME	ME	ME	ME	ME	ME
Master in Art (MA)	ME	ME	ME	ME	ME	ME	ME	ME
Teacher received training (tch_train)	ME	ME	-	ME	ME	ME	-	ME
Teacher attendance each year (tch_attend)	-	-	-	-	SE	-	-	-
Teacher years of experience	-	-	ME	-	-	-	SE	SE
Teacher house (resident) in the same district where he teach (tch_house)	* (+)	-	* (-)	-	-	-	* (+)	* (+)
Household having agricultural land (hh_agr_land)	ME	-	ME	ME	ME	ME	-	ME
Family annual income (hh_m_inc)	ME	ME	ME	ME	-	ME	-	ME
Working abroad	-	-	-	-	ME	-	-	ME
Household occupation (hh_occup):								
Daily wages (DW)	ME	ME	-	-	-	-	-	-
Services (service)	ME	ME	-	-	-	-	-	-
Others (others)	ME	ME	-	-	-	-	-	-

If p > 0.1, to be considered as No evidence against the null (NE)

If 0.05 < p < 0.10, as Weak evidence against the null (WE)

If 0.01 < p <0.05, as Moderate evidence against the null (ME)

If 0.001 < p < 0.01, as Strong evidence against the null (SE)

If p < 0.001, as Very strong evidence against the null (VSE)

NA denotes not applicable.

It must be emphasized that the individual level regression (at the 10%, 5% and 1%) results also largely support the findings above. However, there are some interesting findings from the individual level regression that are not captured in the above table. These are the relationships between student related factors, such as parent's literacy status and parental support to the student at home for both grades in both numeracy and literacy. The results show that the level of education of parents and parental support are more important in relation to student performance. The implications of this are that parental education and parental support play a particularly important role in helping to motivate students to study and to gain deeper knowledge in their study both maths and Nepali. The second finding of interest in these regressions is the strong positive relationship between teacher characteristics and the ASER score.

CHAPTER - EIGHT
CONCLUSIONS

8.0 Background

The present research has set out data related to policy issues, in particular to what extent progress has been made towards providing equitable and inclusive access to education by 2015 in Nepal and thus meeting EFA targets. Secondly the inquiry has attempted to measure the learning outcomes of pupils at Grades II and IV by using ASER type tools for the first time in Nepal. Finally, by using regression methods, it has explored the key determining factors associated with student learning outcomes as measured by student performance.

This research has increased understanding of the dynamics and magnitude of factors that are associated with the learning outcomes of children in Nepal. It has been possible to relate these research findings to existing theoretical approaches in the national and international literature and to previous research particularly in low-income countries. Some existing findings are confirmed and others challenged. Some areas have received limited or incomplete enquiry and analysis, and new questions and themes have arisen.

This section sets out the initial research questions and considers the extent to which they have been addressed also discussing them in relation to the existing literature (reviewed in Chapter Three). The findings from the current study did not support all of the existing literature in relation to school resources and student performance. This is due to variations in methodological approaches, different models of interventions designed and implemented by different governments and the local context.

The existing literature does not indicate a close and consistent relationship between school input variables and learning outcomes. There is much ambiguity in the findings: as a result there is longstanding concern and on-going debate about the factors which determine student achievement. Hence, there is no single panacea that will fit all contexts and environments. It seems that results vary with the context. Different contexts are diverse in terms of their socio-cultural, geographical, and economic situations. Previous research adopts different methodologies analytic

techniques, and theoretical frameworks. Furthermore, it is interesting to note that these relationships are neither significant on a consistent basis, nor do they vary systematically across and within countries. There is limited research that supports the existence of clear, and consistent findings relating learning achievements associated with a range of input variables in developed, and developing countries. This is particularly so for developing countries.

Considerable research has been undertaken in developed countries for decades; however, there has been little empirical work on the factors which determine access to school and learning achievement in developing countries, particularly in Nepal. Governments, development partners, governmental research agencies, stakeholders, and research scholars around the world still continue to be concerned about the best way to improve education.

There has been a general growth in the international literature and in the research on the quality of education and researchers have measured learning outcomes using standardized tests and a range of factors associated with student performance to assess their impact. One approach is to use the Education Function Approach.

8.1 Theoretical Framework and Education Production Function Approach

This research is underpinned by the Human Capital Theoretical framework. This is one of most popular, well recognized and universally accepted theoretical frameworks for this kind of research and has been so since the early twenty first century. This theory mainly focuses on the need to invest financial resources in education providing people with human capital through formal education and training, which it is argued will ensure and help people to acquire skills and knowledge. This is seen as a productive and efficient use of resources increasing levels of earning and employability. Ultimately this will increase the productivity of the labour force in a country and as a result it will contribute significantly to the national income and economy of the country.

Numerous studies have been carried-out based on the HCT methodology which was initiated by Becker (1964) and followed by Mincer (1974). Since then it has continuously been used in social science research which has had a focus on the

economics of education. For example the Global Monitoring Report (2009) clearly indicated that there was a link between education and economic growth, income distribution and poverty reduction. Education equips people with the knowledge and skills they need to increase income and expand opportunities for employment. This is true for households and for national economies. Levels of productivity, economic growth and patterns of income distribution are intimately linked to the level of education and the distribution of educational opportunity.

Therefore, the framework (HCT) used in this study is in line with the international literature. A well educated and trained labour force being up to date with the technology, having managerial skills, and high levels of competency will significantly contribute to and increase efficiency and productivity for working organizations. Hence, investing more in education will contribute to and increase the economic growth of the national economy of a country.

In the current study the education production function approach has been employed in estimating the learning outcomes of children. Theoretically, the production function is a mathematical expression of an input-output relationship showing the maximum amount of output that can be obtained from a given set of inputs. This function describes a linear relationship between input and output variables and also focuses on establishing causal relationships between resources and student outcome. It sets out the relationship between each unit of an input and student performance regardless of the existing level of that input. However, in practice, many of the input variables have a diminishing marginal influence and association with student performance.

The educational production function approach is relevant and appropriate to the contemporary social context of Nepal. This model has helped in investigating the learning outcomes of pupils and the determinant factors in literacy and numeracy outcomes in Nepal.

This is the first time the ASER tool has been employed to measure student performance at the school and individual level in Nepal. The findings are therefore of particular importance especially for Nepal and will add value to generating and to contributing to new knowledge.

8.2 Research Question 1: Access and Progress towards EFA in Nepal

The first research question was designed, to establish whether or not there had been progress [and adequate progress] towards EFA in terms of equity and inclusion in access to primary education in Nepal.

The ongoing SSRP (2009-2105) provides a plan and documents, it aims to increase access to and improve the quality of school education, ensure equitable access to quality education focusing on basic education and on children from difficult circumstances particularly from marginalized social groups. The GON aims to deliver educational services efficiently and effectively, therefore the SSRP plan envisages bringing about substantial improvement in access to education and also to improve the quality of that education within the framework of EFA and MDGs.

The Government of Nepal has focused on the education sector since the early 1990s through various programmes, implemented with the support of a large number of Development Partners (DPs). These were: BPEP (I and II) and most recently EFA (2004-2009) and the SSRP (2009-2015). These programs have substantially contributed to improvement in the education sectors outcomes especially in primary level educational outcomes particularly in relation to enrolment. Below are the key findings in relation to access to primary education in terms of equity and inclusion in Nepal. The Net Enrolment Rate (NER) at the primary level (Grades I-V) increased from 67% in 1995 to 93% in 2003, and reached 95% (94.5% of girls and 95.6% of boys) in 2012. However, the slow NER increase with an average of 1% every year is not sufficient to ensure that by 2015 the EFA targets are met.

- The increase in the primary school net enrolment (GER and NER) has narrowed gender disparities, mainly through the increase of NER in girls.
- The NLSS data clearly indicated that children from low income groups particularly girls do not attend schools, where the number of children from Dalit and Janajati social groups is large.
- The distance between home to school seems reasonable and at a satisfactory level (on average half an hour to walk to school) at a national level. However, there are many disparities between urban and rural school availability and

location. Rural schools are often located far from disadvantaged ethnic minority people's settlement areas.

- The households with easy access to schools are more likely to enrol their children at school. Therefore, the proximity to school (distance) is one of the key issues for access to education and school for some social groups. Furthermore, it is a key determining factor for enrolment and also may affect the attendance rate of children.
- Despite the substantial progress in access to primary level education towards achieving the EFA and Millennium Development Goals (MDGs) significant challenges remain for meeting the EFA targets.
- Progress still needs to be made in relation to dropout rate and retention rates for children in primary schools. Only 66% of children complete primary level education (Grade I-V).
- The internal efficiency rates are low with more than 20 percent of students dropping out after Grade I, and 30 percent repeating a year. These rates are significantly higher for girls in particular in disadvantaged communities and ethnic minorities.
- There are large disparities between enrolment and completion rates in rural and urban areas, and in children from indigenous peoples and other marginalized communities. Those living in rural and difficult geographic areas often receive poor quality education.
- The attendance rate is another concern. Only 65% of children were attending on the researcher's school visit day. There was a huge gap in the average attendance of the students between government (53%) and private schools (84%). The attendance of girls who were studying in private school was almost 93%, whereas in government schools it was only 54%. These attendance rates were also substantially lower for girls from ethnic minorities particularly those in remote and difficult geographic areas.
- Student enrolment in private schools has risen significantly from 10.3% in 1995/96 to 18.4% in 2003/04 reaching 28.1% in the year 2010/2011.

- If the present trends continue and the government is able to devise adequate policies to address getting the existing out of school children into school, it is likely that Nepal will achieve UPE by 2015.

In conclusion, this element of the research concluded that according to published data Nepal has made remarkable progress, particularly in enhancing universal access to primary education at the national level. However, there continue to be huge variations between urban and rural areas, and at regional, district levels. Furthermore, there are substantial differences in access between gender, ethnicity, and geographical areas in disadvantaged social groups particularly in economically backward indigenous minorities such as Dalit and Janajati girls. High drop-out and repetition rates are more prominent in these elements of the population. In addition to that, there is a hard core group of children who have never entered the education system. Thus, the data and analyses suggest that existing policies have failed to lead to an equitable and inclusive access to education at primary level in Nepal.

To conclude that there is a need to review current policies and formulate appropriate programmes to ensure that all out-of-school children enrol in school, the grade repeaters and school leavers complete their primary level education, particularly girls from ethnic minorities and disadvantaged communities living in difficult areas. Further research is required to explore the possible causes and determining factors that lead to failing to achieve the EFA targets on time (by 2015).

Much research has been undertaken in relation to access to education particularly in developing and less developed countries (see section 4.9).

Ranabhat (2009) concluded that Nepal has made remarkable gains towards expanding access to universal primary education in the school system at primary level. However, there is still a long way to go and the rate of progression is too slow because school access is too uneven with deep and consistent disparities between geographic eco-belts and more specifically at the intra-district and school level. Furthermore, relating to the availability of schools at the regional level, Terai households in rural areas have somewhat better access than the Mountain and Hill counterparts, furthermore, richer households which are closer to a school than poorer households have better access to primary education in Nepal.

The availability of schools between 1995/96 and 2003/04 (NLSS I and II) has improved almost universally across all types of facilities. The proportion of households having access to primary schools within 30 minutes (of travel time) was 88.4% eight years ago, and now stand at 91.4%. However, the pace of development of school systems has been uneven and insufficient as in 8.6% households (NLSS 2003/04) particularly in remote rural areas student are still deterred from school attendance because of their location in relation to the school. In addition, richer households which are closer to school than poorer households have better access (Ranabhat and Thompson, 2011).

The findings reported in this thesis on access to education are similar to those in the international literature. While there is overall improvement in enrolment and attendance, there are differences depending on regional, gender and socio-economic factors.

Policy Implications:

Key achievements and gaps between policy commitments and program implementation

The primary level GER rose to 139.5% in 2010 from 108% in 1990, an increase of over 31 percentage points. Girls had the highest increase in enrolment from 82% in 1990 to 144.8% in 2010. All this resulted in an improvement in the Gender Parity Index (GPI) in NER of 0.98 in 2010 from 0.56 in 1990. The primary level NER for Grade I-V (for both boys and girls) improved to 94.5% in 2010 from 67.5% in 1995. However, this progress has been uneven between consumption quintiles, location, castes and ethnic groups.

Expanding access and improving affordability for excluded groups

Overall progress towards universal primary education in the past decade has been encouraging as demonstrated by the numbers of children in school. However, it is estimated that hundreds of thousands (4.9%) of children of primary school age are out of school, either because they have never entered the education system, or because they have dropped out.

Changing this scenario and accelerating progress towards the goal of universal primary education by 2015 requires action at all (community, district, regional and central) levels. Improving opportunities in education would require reduce costs and bringing schools closer to disadvantaged and marginalized children.

The analysis of enrolment and internal efficiency of primary education demonstrated huge discrepancies in progress towards UPE due to gender, caste and ethnicity, location, household wealth and other factors. Although the findings between school census data and household survey data vary, they powerfully illustrate the gap towards making right to education a reality for all of the school aged children in Nepal.

The impressive progress towards universal primary education in school systems marked by high levels of late entry (over-aged and under-aged children), dropout and grade repetition is a common phenomenon in government schools. From enrolment to completion and beyond requires concerted effort and targeted interventions to achieve the goal of all children entering school at an appropriate age, progressing smoothly through the system, completing a full cycle and transiting to the next level.

Policy options

Data from RQ1 suggest that policy options should include:

(I) Introducing free and compulsory primary level education with the provision of a school guarantee scheme that rationalizes existing schools and helps to establish new schools in needy areas for ensuring access for all eligible children particularly in disadvantaged ethnic minorities areas.

(II) Designing appropriate programs and financial packages that support and motivate uneducated poor families and the parents of children who are unwilling to enrol their children and continue to allow them to attend school; provide educational opportunities for girls who are lagging behind and finally increase access to post-primary education.

(III) Reforming scholarship provision to make it more effective and also target girls especially those from socially deprived groups, in order to ensure that they have access and make equal progress in comparison with boys and other mainstream privileged groups.

(IV) Increasing the qualifications of teachers with specialist courses related to teaching and learning activities and enforce the adequate provision of school related practical and interns courses to ensure high quality education.

(V) Establishing an accountability framework along with a strong monitoring and evaluation system and strengthen the school based management approaches adopted under the current regulations with an emphasis on capacity building at the community and school level.

(VI) Paying more attention to school policy on attendance in relation to compulsory student policies specially for hilly- rural, and mountainous areas, where poor attendance has been found. Schools can offer attractive programs such as offering prizes or incentives for students which will increase attendance and make students attend more regularly. The school can require regular meetings and consultations with parents, where students' attendance is low and irregular. Also the District Education Office could make a link with the budget released to schools with a condition of certain threshold percentage of attendance of students.

8.3 Research Question 2: Learning Achievement

The second research question focused on the level of learning achievement and to what extent there were differences between different schools and individuals. Student achievement was highly heterogeneous, varying by the level of family income and geographical location.

- Only 60% of students passed the ASER test at Grade IV and only 49% passed at Grade II in Nepali, while only 15% passed maths at Grade IV and 44% passed at Grade II.
- There were marked differences in student attainment in terms of gender, ethnicity and geography predominantly for Dalits and ethnic minority marginalized Janajati.

- The private schools outperformed (73%) government schools (47%) at both Grades (II, IV) in Nepali. In maths the private schools (50%) performed better than government school (21%) across the country. There was large variability of mean pass rate scores with a statistically highly significant level.
- Only half of the student (60%) was passed the ASER test at Grade IV and only 49% passed at Grade II in Nepali, by contrast only 15% passed at Grade IV in maths and 44% passed at Grade II in maths.

The vast majority of primary school children were underperforming in terms of their learning performance in government schools in comparison to private schools particularly girls from rural areas and ethnic minorities groups. However, the pass rates for private schools needed considerable improvement.

International studies have examined learning outcomes through standardised testing include TIMMS, PIRLS (assessing mastery of a particular curriculum) and PISA (assessing skill for life) and SACMEQ (assessing maths and reading) in developing and less developed countries (see section 4.9).

Particularly relevant to this research is that undertaken in India using the ASER tools and methodology. In India learning performance of primary school children was at a similarly low level to Nepal. ASER (2008) found that a nationally 44% of students at Grade V could not fluently read at Grade II level test nor do a division sum of three digits divided by one digit. Similarly ASER (2011) found that only 38% of rural Grade IV students could read a text designed for Grade II. Even after eight years of school, 18% of students were unable to read the Grade II text.

The findings on learning achievement for primary school aged children in Nepal, are similar to those in India. Percentage pass rates are generally low for children in India and Nepal. They are not achieving at the levels expected for their age.

Policy Implication:

There is an information deficit, what follow are some policy recommendations in relation to the learning achievement of students which will help to improve outcomes for primary school children in Nepal.

(I) The government should put in place a policy to identify the achievement level of students in each grade by using regular assessments. These assessments

will also need to be verified by an independent agency. Students who are weak and found to be at the lower levels of performance need to receive additional support and extra classes with appropriate teaching and learning materials e.g. basic level textbooks, exercise books, and also instructional materials. These will provide an opportunity for these children to learn and upgrade their levels and competencies.

(II) The government needs to provide a special training package for teachers which will help to develop and ensure their skills, knowledge and level of competency in teaching these unique groups of students with a view to improving and upgrading their level of education to reach par with better performing students.

(III) The current government initiation for language policy and practices in primary school education, including the medium of instruction is questionable and needs to be reviewed. For students who are non-Nepali speakers, the government needs to provide them with their mother tongue as a medium of instruction alongside a program for language transition to be introduced at least for the lower grades at primary level.

(IV) The government authorities need to pay special attention to rural schools and allocate additional finance and provide intensive support by providing the required facilities and financial resources to these schools.

(V) The government authorities and development partners need to pay special attention to raising the quality of education in rural schools in order to reduce the existing gap between government schools and private schools including differences in urban, and rural areas, ethnicity and different economic quintiles.

(VI) An effort should be made by the government to lessen the existing gap between urban and rural schools in both government and private schools. Furthermore, rural schools deserve special attention in terms of raising the quality of education, particularly in regards to teaching and learning activities.

(VII) The government schools should learn from the private schools in terms of providing quality instructions particularly in maths, in relation to school structure and management, mainly in terms of management for financial resources and human resources. Furthermore extracurricular and non-academic activities (such as:

sports, music, drama, other confidence building programs), which will motivate and engage students and may lead to better performance must be encouraged.

8.4 Research Question 3: The Determinants of Student Performance

The final research question focused on the determinants of student performance. The key findings are set out below: At the school level of analysis student attendance, student teacher ratio, availability of required textbooks, school location and teacher training had statistically significant negative relationship with learning outcomes. Head Teachers years of experience also emerged as an important factor in school and had a statistically significant positive relationship with learning outcomes.

- At the individual level, student teacher ratio, student attendance and availability of required textbooks were the key predictors of passing the ASER tests.
- The results showed that household related factors such the level of education of parents and parental support were much more important in relation to student performance than school factors. This replicated the findings of Coleman et al (1966).
- From the finding that a student's characteristics and family related factors are at least as important as school factors including teachers' characteristics in determining student performance, it would be reasonable to conclude that policies should address these determining factors in order to improve primary school children's performance.

Section 4.9 set out the international literature relating to the key determinants of student performance. In the US a range of studies (Coleman Report, 1966, Jencks et al. 1972,1979; Alexander & Eckland, 1980, Hanushek, 2003) all concluded that a student's family background was a far more important predictor of educational attainment than any school factors.

The conclusion that students' achievement is overwhelmingly determined by home background factors in developing as well as developed countries has been challenged by Heyneman and Loxley (1982,1983). They argued that whereas in developed countries, the home background of students mattered much more to achievement than school quality, the reverse was true in low income countries.

However, this might be explained by the emphasis on science as opposed to literacy and numeracy.

Hanushek (2003) concluded that parental income was found to have an a positive association on student performance, children from the richest economic families had higher test scores.

Using the TIMMS data, Wobmann (2000) found that the test scores of students living with both parents were higher than those of other students. Similarly in India Kingdon (1998) showed that home background and school influences were both important factors related to students' achievement. Many studies have indicated that the level of education of parents is one of the most important determining factors of student performance (Hanushek and Luque, 2003 and Wobmann,2000). For example, they found that, of the variance in science achievement that could be explained in India, 90% was attributed to school and teacher quality and only 10% to home factors.

However, science because of its specialised knowledge base may be less influenced by home background than literacy or numeracy. A review of the literature drawing on different studies (Krueger,1997, Case and Deaton,1999; Hanushek 2003, Wobmann and West, 2006), on Pupil Teacher Ratio (PTR) and class size revealed that there was a strong and significant association between Pupil Teacher Ratio, enrolment, and test scores, particularly for black students in minority classes.

Research in developed countries particularly from the US concluded that school inputs such as teacher related factors (salary, qualification and experiences) and STR did not effect student test score performance. However, Card and Krueger (1992.1996) and Krueger (2003) using different measure of education outcomes, found that lower class sizes had strong and positive effects on future earnings. Furthermore, research focusing on developing countries also point to school infrastructure to be an important factors which has a significant and strong association on student performance.

Research has generally shown a weak relationship between educational resources and student performance, with more variation explained by the quality of human resources (i.e. teachers and school head teacher) than by material and financial

resources, particularly among industrialised nations (Fuller, 1987; Rivkin, Hanushek and Kain,2005).

Heyneman and Loxley (1982), using EPF to estimate the key determinants factors, showed that ninety percent of the variance in student science achievement was explained by school and teacher variables and only a small proportion by home related factors. The results revealed that there was a positive significant relationship with small size between the family related factors and students' performance. Homework support from the parents, the student living with parents, parental literacy levels and student religion seem important and statistically significant variables in relation to student performance. This conclusion is supported by this research that to some extent the household related factors (such as family incomes, working abroad and service and those with adequate agricultural land) have a statistically significant association with student performance.

Fuller (1986) showed that there were number of school input variables directly linked to the instructional process which consistently influenced and had an association with student performance. For instance of the twenty-two studies of the influence of textbooks, fourteen have found a significant effect on achievement. Similarly fifteen of the eighteen studies relating to school libraries (and intensity of utilisation) found that they contributed to student performance.

There are number of studies which demonstrate a strong statistically positive association between school resources and student performance. For examples, Sheerns (2004) mentioned the availability of textbooks leading to higher performance.

- **At the individual level**

The logistic multivariate regression analysis at the individual level revealed the association between various independent variables (input) and student performance (dependent). These are summarized below:

- Parental literacy, parents helping students to study, student religion, and student caste were the most common highly significant factors in relation to the individual performance of the students.

- School related factors such as availability all of the required text books, having a Nepali dictionary, having an academic calendar and building type were identified as significant predictors of the individual performance of the students.

- Teachers' qualifications were a statistically significant factor among the teacher related factors in both subjects (Nepali and Maths) and for both Grades (II and IV). Other factors such as teacher caste, teacher sex, and age and teacher experience also showed an association with the students' performance.

- The income of the household, agricultural land and types of occupation of the family member(s) of the students were found to be important predictors among the family related factors for the performance of the students at individual level.

- The teachers having a high level qualification was not found to be strongly statistically significant. The negative Beta value showed that having a high level of qualification did not necessarily make any difference in the student performance. It raised the question as to whether or not the general qualifications of the teacher are relevant in relation to student's performance.

- In terms of the teacher's ethnicity, the individual performance of the students having Janajati and Dalit teachers were observed to be significantly better than having Mainstream teachers by almost more than three times in each category.

The most important determining school factors were student teacher ratios, student attendance, the number of days the school was open and student attendance as recorded in the school register. Teacher related factors such as training, qualifications and years of experience were found to be important.

The factors such as the availability of all of the required textbooks were important regardless of grades and location of schools either urban or rural areas. Other factors such as library, having a dictionary and having a school calendar had negative relationships with learning outcomes.

These findings are consistent with what is known from the literature in that the key determining factors related to student performance are mainly family related factors and teacher related factors.

Policy Implications:

Teacher:

(i) *Teacher Attendance*: Schools need to make teacher attendance compulsory. It may be helpful to reduce the absenteeism of teachers by offering scheme such as cash prizes; marks for promotion; educational trips etc. which will encourage and motivate them to attend regularly. To minimize the impact of the absence of the teachers while they are undergoing training, the training program should be arranged during the summer or winter vacations so that the classes are not disrupted.

(ii) Teacher Training: The findings revealed that the trained teachers did not produce better results in relation to student performance. This result may be an indication that the government's current training package needs to be reviewed in order to make the training more relevant. Therefore, it calls for a thorough review and redesign of the training package including the training approach, content of the training and methodology for conducting the trainings in order to make such training more relevant.

(iii) The findings indicated that when recruiting the teacher workforce, the government needs to give special priority to the Dalit and Janajati groups. This will provide an opportunity for more of them to enter the teaching profession. Possibly, this will engage and motivate more students from the same ethnicity and also lead to better student performance.

(iv) The finding of this study also suggested that the teachers' training did not transfer effectively into them using their knowledge and skills in the classrooms. Based on these findings, the training components and curriculum should be more practically oriented rather than theoretical, for e.g. the trainer can demonstrate skills and teaching techniques with practical examples in a real classroom with students rather than in the artificial environment of a training hall.

Before starting the training, the teacher should have a formal test for example for an English teacher an International English test such as APTIS or ILTES test, so that, the level and competencies of teachers are known. Then according to their level training can be offered to them. Teachers attending the training who have very low

competency levels may not be able to absorb the training skills and knowledge or deliver the required skills and techniques in the classroom. Therefore these group of teachers need to provide the basic level-I and those achieving high levels will receive advance level training.

(v) The study showed that higher teacher qualifications were significantly negatively associated with the student performance. This findings suggests that high qualifications of the teachers do not necessarily produce better results for the students. This raises the question as to what teacher qualifications are relevant for undertaking a teaching job. Therefore, the government authorities need to focus attention on specialised course with relevant content which directly relates to the teaching and learning process.

Textbook: Unavailability of all required textbooks in a timely fashion was one of major concerns raised by schools, School Management Committees, Parent Teacher Associations, Parents, Stakeholders and Development Partners. It is a crucial issue for the Nepal school education system.

Government agencies- The Jansikshha Samgri Kendra Limited and Sajha Limited are solely responsible for the production and distribution respectively of textbooks for all government school across the country. They have failed to deliver all the sets of required textbooks on time even at district headquarter level locations over the last decade due to their lack of technical capability, planning of work and accountability and responsibility to public. Therefore, there is an urgent need to review the policy and an immediate steps to improve the situation in relation to to the production and distribution of textbooks.

A fundamental change is necessary in this regard to make implementation more effective. One possible arrangements would be to change its legal status of these companies from sole government agencies into public private partnership companies including the private sector and key educational stakeholders who are working in the field of education.

(vi) School facilities such as types of school building (pukki- concrete or Kachhi-temporary), space in the classroom, availability of writing boards, instructional

materials (map, chart, Globe, Dictionary- Nepali or English), library, and computer facilities etc. are prominent factors for better outcomes at the primary level school.

The primary schools located in urban areas and located near to district headquarters were found to have the basic facilities at a reasonable level. Further, lower secondary with primary, secondary with primary and higher secondary with primary schools, possess these at a satisfactory level irrespective of rural or urban locality. However, in the primary schools (grades I - V) located in rural hilly and mountainous areas these facilities are rarely available.

(vii) Therefore, the existing government blanket approach (regardless of school status, geography, the government allocates a minimum equal amount of budget for all government school) to resource allocation is called into question. There needs to be a thorough review of the existing policy and the adoption of an equitable and justifiable scientific approach budgets according to the needs and priorities of schools.

Social disadvantaged and ethnic minorities group:

This study concluded that socially disadvantaged and ethnic minorities groups of children (Dalits and Janjati) performed comparatively worse than other students from mainstream groups (privileged and upper castes). The parent literacy rate was found to be substantially lower. This affects the children's learning support at home. To tackle with this, government policies should empower these marginalized population groups who are illiterate. The government must offer non-formal education for these groups of parents so that as a result, they will be able to provide the necessary support in terms of assisting their children’s learning.

This analysis suggested that there is a need to review current ethnicity based scholarships and other benefits provided by government authorities. Also the government policies should be focussed on empowering marginalized population groups who are illiterate by offering non- formal education for that group of parents and communities.

There is a need to review current ethnicity based programs, financial assistance , schemes for different types of scholarships and other benefits provided by the

government authorities(central government and local government) that should focused on poor, economically disadvantaged, disabled, oppressed members of these population groups, who deserve to have access to these facilities. Such as approach will provide opportunity and ensure that these groups have equitable and inclusive access to education and support them to complete their full cycle of primary education ensuring reasonable level of quality education.

8.5 Suggestions for future research

Based on the analytical accounts in the preceding sections, the following recommendations are offered to enable the government authority to reshape policy options that would potentially ameliorate existing conditions to assist them to make further progress in the critical area of the high degree of disparity in access and participation in the primary schooling system in Nepal. The issues of quality in education have been foregrounded in research in developed and developing countries but less so in less developed countries such as Nepal. Therefore there is a need for further research in this field that would make a valuable contribution to the existing body of knowledge and should underpin future policy reform in order to improve quality in education.

The model that was employed in this study could be used with different sets of populations including economic-groups, eco-belts, particularly ethnic minorities and disadvantaged communities. Studies using this model could also be used to investigate upper (lower and secondary) and tertiary level education for different subjects. The results of these studies would provide further valuable insights into the validity of the model and what predicts the outcomes of students' learning. This study is believed to be the first of its kind in Nepal that aimed to assess students' performance and to identify factors that determine literacy and numeracy standards at primary age.

The data set of the four thematic areas could be used as base-line indicators and further research could be conducted that would gather the data as an on-line survey. The present study did not directly examine language and ethnicity issues which are regularly reported in other parts of the developing world at primary level in

terms of policy reforms, and programme formulation. They are prominent features in Nepal and would constitute an extension of this area of study.

Finally, educational authorities including planners and policy makers, development partners and all stakeholders should give due consideration to the significant variables in the study and endeavour to further improve the efficiency and effectiveness of the education system in the country.

As a concluding note on the policy implications of the findings summarized in the previous sections, it should be emphasized that the important role of economics in determining student performance is also reiterated by the significant positive association between family economic circumstances and student performance.

Recalling this finding alongside the finding that a student's characteristics and family related factors are at least as important as school factors including teachers characteristics in determining student performance, it would be reasonable to conclude that Nepal's national education and social policies should address these factors while focusing on improving the primary school children's performance.

In other words, the policies should be student performance-centred while the plans and programmes aimed at improving the quality of education, empowering marginalized populations, reducing inequalities and scaling-up the economic development of the country should be contextual take account of local contexts.

Finally, the study findings, policy implications and further research avenues may move policy makers, planners, and government authorities including the donor partners in Nepal to pay more attention to factors associated with school participation and the learning outcomes of primary level children on Nepal.

8.6 Limitation of this research study

Like every study has its own limitation, this study is also not an exception. However, the limitations of the study were discussed to some extent in the second chapter (sub-section - 2.4). A brief summary of those in addition is described below in this part.

- Additionally, this study did not collect the prior achievement scores of individual children and information on peers. This is clearly discussed in the methodology chapter, which may have a large effect in the student performance. Due to the low number of students enrolment in the school, and so only half of the students were found to be present during the school visit day therefore only 83% (n=493) student were able to attend the ASER test. Thus, it also effects the aggregate percentage pass rate in ASER results at school level and individual level.

- There is a possible problem of data inaccuracy as some parents were willing to respond but were illiterate. So some information in relation to households information such as their source, level and amount of income may be inaccurate. The parent discussed some responses with their children. These responses may not accurately represent the views of the families when attitudinal questions were asked. However, aside from these caveats, there is no reason to doubt the reliability of the data. The data collection was carried out effectively given the constraints of time and resources.

- A two stage stratified random sampling method was adopted and the schools were selected exclusively through random procedure. Moreover, the students were also selected randomly without any prejudice of the researcher. However, in the Nepalese context collecting data is very challenging which might limit the perfect precision of the estimates.

- This study does not cover all grades (I - V) at primary level of education in Nepal. The total sample size of 30 schools from the more than 33,000 schools in the study area is a potentially limiting factor.

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नाम:..... कक्षा:.....

असर परिक्षा
पढाईको परिक्षा

कथा

राजु नाम गरेको एउटा केटो थियो । उसका एक जना दिदी र एक जना भाइ थिए । उसको भाइ गाँउ नजिकको विद्यालयमा पढ्न जान्थ्यो ।

ऊ धेरै मेहनत गर्थ्यो । उसकी दिदी असल खेलाडी थिई । ऊ धेरै समय सम्म दौडन रुचाउँथी । ती तीन जना आनन्द पूर्वक बसेका थिए ।

पाच सोध्ने ५ मा ४ वटा ठिक हुनु पर्ने

अनुच्छेद

पूजा नदीको किनारमा बस्छे ।

नदीमा धेरै माछाहरु छन् ।

पूजा उनीहरुलाई आहारा दिन्छे ।

ती सबैले राम्रोसँग आहारा खान्छन् ।

अनच्छेद

कालो बादल लागेको छ ।

घनघोर पानी परिरहेको छ ।

मयूर नाचिरहेको छ ।

सबै जनाले नाँच हेरिरहेका छन् ।

पाच सोध्ने ५ मा ४ वटा ठिक हुनु पर्ने

नाम:..... कक्षा:.....

असर परीक्षा
पढाइको परीक्षा २

अक्षर

म र थ

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पाच सोध्ने ५ मा ४ वटा ठिक हुनु पर्ने

शब्द

आमा सुख

रोटी

पैसा झोला

आलु धुप

किला

काग खोर

पाच सोध्ने ५ मा ४ वटा ठिक हुनु पर्ने

Number Recognition	Number recognition	Subtraction	Division
3 7	65 38	51 67 -35 -48	7)918(
1 4	92 23	87 73 -49 -36	6)769(
8 9	47 72	46 31 -37 -13	8)983(
5 2	56 87	45 43 -18 -24	4)513(
Ask 5, of which 4 must be correct	Ask 5, of which 4 must be correct	Ask any 2. Both must be correct	Ask any 1, which must be correct

Annual Status of Education Report
असर ASER 2010
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नाम:..... कक्षा: ..... MATH TEST/ गणित SAMPLE (1)

अंक पहिचान	संख्या पहिचान	घटाउ	भाग
३ ७ १ ४ ८ ९ ५ २	६५ ३८ ९२ २३ ४७ ७२ ५६ ८७ २९ ११	५१ ६७ -३५ -४८ ८४ ७३ -४९ -३६ ४६ ३१ -३७ - १३ ४५ ४३ -१८ -२४	७)९१८(६)७६९(८)९८३(४)५१३(
पाँच सोध्ने पाँचमा ४ ठिक हुनुपर्छ ।	पाँच सोध्ने पाँचमा ४ ठिक हुनुपर्छ ।	दुई सोध्ने दुवै ठिक हुनुपर्छ ।	कुनै एक सोध्ने त्यो ठिक हुनुपर्छ ।

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ASER TOOLS

Translation of the ASER tools from Nepali to English

TEXT- I	TEXT- II
Pooja lives nearby the river.	The sky is cloudy.
There are a lot of fishes in the river.	Heavy rain is pouring down.
Pooja feeds all the fishes.	The peacocks are dancing.
All the fishes eat the food.	Everyone is watching the dance.

STORY

There was a boy called Raju. He had a sister and a brother. His brother studied in the school located near the village.

His brother was very hardworking. His sister was a good athlete. She liked running for a long period of time. These three lived very peacefully.

Translation of the ASER tools from Nepali to English

TEXT- I	TEXT- II
M O Q	Mother Happiness
	Bread
X U	Money Bag
S R J	Potato Candle
	Nail
A D	Crow Cage

Individual Level Results

Annex 2.1 (a) Multivariate Logistic Regression at Grade II Nepali for All (Government and Private) schools: at 99% level of significance

Variable	*β*	S. E.	p-value	99% CI	
Student related factor (n = 141)					
std_hw_prnt	-1.123	0.372	0.003	-1.977	-0.259
std_rlgn1	-1.116	0.420	0.008	-2.203	-0.415
std_p_litra	-1.210	0.461	0.009	-2.012	-0.324
constant	0.829	0.311	0.008	0.321	1.403
Log - likelihood = - 85.217, Pseudo R^2 = 0.133					
School related factor (n = 216)					
nepdisnry	-0.596	0.506	0.243	-1.191	0.120
calendr	-1.114	0.325	0.001	-1.560	- 0.367
build_typ	0.980	0.341	0.004	0.112	1.233
constant	-0.545	0.418	0.194	-1.301	0.171
Log - likelihood = -112.61, Pseudo R^2 = 0.310					
Teacher related factor (n = 242)					
tch_eth1:					
Janajati	1.209	0.380	0.001	0.433	1.632
dalit	1.213	0.270	0.001	0.420	1.291
tch_qulf:					
SLC	-0.379	0.310	0.220	-1.011	0.217
BA	-0.422	0.380	0.267	-1.120	0.384
MA	-0.337	0.751	0.653	-1.032	0.510
constant	-0.870	0.542	0.110	-1.324	0.323
Log - likelihood = -150.241, Pseudo R^2 = 0.210					
Family factor (n = 98)					
hh_agr_land	0.238	0.410	0.563	-0.703	1.121
hh_m_inc	-0.312	0.310	0.316	-1.012	0.234
constant	-0.480	0.478	0.317	-1.354	0.215
Log - likelihood = -56.54, Pseudo R^2 = 0.311					

Dependent variable: pass/fail status of students through ASER score

Annex 2.2 (a) Multivariate Logistic Regression at Grade II Nepali for (Government) schools: at 99% level of significance

Variable	*B*	S. E.	p-value	99% C.I.	
Student factor (n = 93)					
std_hw_prnt	-2.082	0.501	0.001	-3.210	-0.713
std_rlgn1	-1.621	0.529	0.002	-2.051	-0.486
std_p_litra	-1.231	0.690	0.078	-2.381	0.133
constant	0.829	0.286	0.004	0.405	1.250
Log likelihood = -85.71, Pseudo R^2 = 0.129					
School factor (n = 124)					
hm_qulf:					
SLC	-0.379	0.320	0.238	-1.021	0.158
BA	-0.423	0.491	0.390	-1.101	0.262
MA	-0.439	0.951	0.644	-1.152	0.346
calendr	-1.048	0.366	0.004	-1.703	-0.188
build_typ	0.870	0.341	0.010	0.123	1.434
all txt books	0.853	0.320	0.008	0.121	1.522
constant	0.194	0.286	0.499	-0.421	0.654
Log likelihood = -79.064, Pseudo R^2 = 0.431					
Teacher factor (n = 140)					
tch_eth1:					
Janajati	1.311	0.340	0.001	0.481	1.430
Dalit	1.312	0.502	0.010	0.621	1.642
tch_qulf:					
SLC	-0.370	0.326	0.258	-1.031	0.203
BA	-0.511	0.364	0.162	-1.122	0.524
MA	-0.638	0.856	0.457	-1.061	0.742
tch_rlgn1	-2.110	0.265	0.001	-3.415	-0.513
constant	-0.723	0.203	0.001	-1.860	-0.046
Log likelihood = -79.320, Pseudo R^2 = 0.136					
Family factor (n = 64)					
hh_occup:					
DW	0.116	0.719	0.872	-1.280	1.123
Service	1.604	0.900	0.080	-0.710	2.267
Others	-0.793	0.680	0.250	-1.901	0.702
hh_m_inc	-0.358	0.385	0.355	-1.022	0.761
constant	-0.512	0.512	0.322	-1.120	0.289
Log likelihood = -84.490, Pseudo R^2 = 0.151					

Dependent variable: pass/fail status of students through ASER score

Annex 2.3 (a) Multivariate Logistic Regression at Grade II Math for All schools (Government and Private) schools: at 99% level of significance

Variable	*β*	S. E.	p-value	99% C.I.	
Student factor (n = 216)					
std_eth1:					
Janajati	-0.766	0.520	0.143	-1.401	0.114
Dalit	0.065	0.632	0.918	-1.178	1.145
std_rlgn1	-0.951	0.660	0.151	-1.696	0.108
std_p_litra	-1.242	0.308	0.001	-2.051	-0.390
constant	0.871	0.642	0.175	-1.096	1.925
Log likelihood = -132.211, Pseudo R^2 = 0.120					
School factor (n = 246)					
hm_qulf:					
SLC	-0.370	0.220	0.093	-1.091	0.278
BA	-0.441	0.312	0.158	-1.103	0.389
MA	-0.457	0.761	0.548	-1.094	0.340
engdisnry	-1.301	0.613	0.040	-2.306	0.256
constant	-0.394	0.309	0.205	-0.832	0.364
Teacher factor (n = 242)					
tch_qulf					
SLC	-0.370	0.334	0.268	-1.021	0.197
BA	-0.476	0.363	0.191	-1.141	0.398
MA	-0.456	0.812	0.574	-1.105	0.358
tch_house	3.441	2.020	0.090	-1.725	1.757
constant	-0.483	0.340	0.156	-0.751	0.218
Family factor (n = 98)					
hh_agr_land	0.247	0.390	0.528	-0.721	1.147
hh_m_inc	-0.352	0.230	0.129	-1.024	0.240
hh_occup:					
DW	0.113	0.713	0.874	-1.281	1.426
Service	1.516	0.716	0.110	-0.145	2.706
Others	-0.681	0.410	0.238	-1.915	0.725
constant	-0.51	0.430	0.204	-1.230	0.176

Dependent variable: pass/fail status of students through ASER score

Annex 2.4 (a) : Multivariate at Grade II Math for (Government): at 99% level of significance

Variable	*β*	S. E.	p-value	99% C.I.	
Student factor (n = 168)					
std_p_litra	-1.199	0.651	0.089	-2.111	0.165
std_eth1					
Janajati	-1.085	0.360	0.002	-1.832	-0.244
Dalit	0.174	0.572	0.761	-0.862	1.104
constant	0.051	0.302	0.866	-0.552	0.438
Log- likelihood = -96.421, Pseudo R^2 = 0.198					
School factor (n = 154)					
libry_yes	-1.139	0.343	0.001	-1.820	-0.237
constant	-0.094	0.234	0.688	-0.540	0.481
Log likelihood = -93.902, Pseudo R^2 = 0.543					
Teacher factor (n = 170)					
tch_age	0.056	0.015	0.001	0.026	0.092
tch_exp	-0.048	0.056	0.392	-0.152	0.050
tch_qulf					
SLC	-0.344	0.346	0.321	-1.110	0.179
BA	-0.421	0.312	0.179	-1.121	0.338
MA	-0.422	0.321	0.190	-1.214	0.478
constant	-2.734	0.604	0.001	-3.900	-1.214
Log likelihood = -100.403, Pseudo R^2 = 0.171					
Family factor (n = 61)					
hh_agr_land	-1.524	0.610	0.020	-2.701	0.213
constant	0.512	0.513	0.322	-0.501	1.125
Log likelihood = -35.989, Pseudo R^2 = 0.191					

Dependent variable: pass/fail status of students through ASER score

Annex 2.5 (a) Multivariate Logistic Regression at Grade IV Nepali for All (Government and Private) schools: at 99% level of significance

Variable	*β*	S. E.	p-value	99% C.I.	
Student factor (n = 235)					
std_eth1					
Janajati	-1.179	0.210	0.001	-1.134	-0.249
Dalit	0.161	0.176	0.361	-1.161	2.604
std_p_litra	-1.345	0.430	0.001	-2.142	-0.539
constant	0.478	0.341	0.162	-0.196	1.560
Log likelihood = -156.991, Pseudo R^2 = 0.291					
School factor (n = 229)					
all txt books	0.855	0.541	0.115	-0.131	1.824
constant	0.705	0.586	0.231	-0.271	1.812
Log likelihood = -157.52, Pseudo R^2 = 0.191					
Teacher factor (n = 170)					
tch_sex	0.901	0.284	0.001	0.322	1.474
tch_qulf					
SLC	-0.242	0.323	0.454	-1.011	0.187
BA	-0.403	0.311	0.196	-1.134	0.329
MA	-0.421	0.330	0.203	-1.214	0.459
tch_attend	-0.980	0.350	0.005	-1.681	-0.194
constant	-0.049	0.172	0.775	-0.397	0.102
Log likelihood = -111.402, Pseudo R^2 = 0.201					
Family factor (n = 95)					
hh_agr_land	-1.520	0.990	0.129	-2.501	0.219
constant	-0.002	0.416	0.776	-0.820	0.716
Log likelihood = -57.051, Pseudo R^2 = 0.162					

Dependent variable: pass/fail status of students through ASER score

Annex 2.6 (a) Multivariate Logistic Regression at Grade IV Nepali for (Government): at 99% level of significance

Variable	*β*	S. E.	p-value	99% C.I.	
Student factor (n = 167)					
std_p_litra	-1.346	0.430	0.001	-2.131	-0.438
std_eth1					
Janajati	-1.288	0.310	0.001	-1.130	-0.249
Dalit	0.161	0.476	0.735	-0.162	1.404
constant	0.376	0.241	0.120	-0.190	0.759
Log likelihood = -141.478, Pseudo R^2 = 0.391					
School factor (n = 143)					
calendr	-1.041	0.352	0.003	-1.500	-0.189
libry_yes	-1.124	0.303	0.001	-1.420	-0.607
constant	-0.799	0.504	0.116	-1.610	0.311
Log likelihood = -92.980, Pseudo R^2 = 0.391					
Teacher factor (n = 168)					
tch_attend	-0.991	0.314	0.002	-1.682	-0.274
tch_qulf					
SLC	-0.242	0.301	0.422	-1.011	0.187
BA	-0.403	0.312	0.198	-1.130	0.309
MA	-0.427	0.302	0.159	-1.212	0.459
constant	-0.049	0.128	0.351	-0.397	0.302
Log likelihood = -107.89, Pseudo R^2 = 0.201					
Family factor (n = 63)					
hh_agr_land	-1.432	0.702	0.050	-2.431	0.209
hh_m_inc	-0.341	0.330	0.310	-1.021	0.240
constant	0.498	0.337	0.144	-0.165	1.140
Log likelihood = -59.20, Pseudo R^2 = 0.171					

Dependent variable: pass/fail status of students through ASER score

Annex 2.7 (a) Multivariate Logistic Regression at Grade IV Math for All (Government and Private) schools: at 99% level of significance

Variable	*B*	S. E.	p-value	99% C.I.	
Student factor (n = 235)					
std_cast1:					
Janajati	-1.119	0.311	0.001	-1.431	-0.359
Dalit	0.121	0.418	0.772	-0.112	1.804
std_p_litra	-1.238	0.430	0.004	-2.121	-0.539
constant	0.379	0.241	0.117	-0.186	0.856
Log likelihood = -154.100, Pseudo R^2 = 0.400					
School factor (n = 223)					
nepdisnry	-2.691	1.023	0.009	-3.697	-0.469
all txt books	0.751	0.441	0.090	-0.120	1.520
constant	-1.457	0.802	0.071	-1.951	1.641
Log likelihood = 124.211, Pseudo R^2 = 0.435					
Teacher factor (n = 212)					
tch_qulf:					
SLC	-0.143	0.243	0.557	-1.010	0.179
BA	-0.220	0.112	0.050	-1.112	0.343
MA	-0.324	0.220	0.142	-1.116	0.479
tch_house	2.941	1.921	0.128	-1.521	3.707
tch_eth					
Janajati	1.315	0.250	0.001	0.482	1.734
Dalit	1.112	0.520	0.033	-0.423	1.690
constant	-1.709	0.801	0.034	-4.800	1.614
Log likelihood = -103.541 , Pseudo R^2 = 0.451					
Family factor (n = 94)					
none					

Dependent variable: pass/fail status of students through ASER score

Annex 2.8 (a) Multivariate Logistic Regression at Grade IV Math for (Government) at 99% level of significance

Variable	*B*	S. E.	p-value	99% C.I.	
Student factor (n = 167)					
std_p_litra	-1.238	0.430	0.004	-2.121	- 0.639
std_eth 1					
Janajati	-1.109	0.320	0.001	-1.141	-0.358
Dalit	0.141	0.328	0.667	-0.112	1.904
constant	0.278	0.230	0.231	-0.181	0.976
Log likelihood = - 141.320, Pseudo R^2 = 0.422					
School factor (n = 161)					
buid_type	2.839	1.050	0.007	0.780	3.596
calendr	-1.144	0.406	0.005	-1.400	-0.169
constant	-5.601	1.980	0.005	-7.074	-3.210
Log likelihood = - 42.998, Pseudo R^2 = 0.221					
Teacher factor (n = 178)					
tch_exp	.0596	0.027	0.028	-0.003	0.114
tch_house	2.601	1.020	0.012	-1.123	3.007
tch_qulf:					
SLC	-0.243	0.249	0.330	-1.110	0.179
BA	-0.320	0.211	0.131	-1.110	0.379
MA	-0.456	0.201	0.024	-1.112	0.389
tch_train	-0.577	0.280	0.040	-0.510	0.167
constant	-3.981	1.99	0.050	-4.412	1.430
Log likelihood = - 46.010, Pseudo R^2 = 0.223					
Family factor (n = 54)					
hh_agr_land	-1.326	0.612	0.032	-2.130	0.212
hh_m_inc	-0.345	0.330	0.297	-1.020	0.170
constant	-0.002	0.417	0.996	-0.821	2.816
Log likelihood = 58.891 , Pseudo R^2 = 0.250					

Dependent variable: pass/fail status of students through ASER score

Annex 2.1 (b) Multivariate Logistic Regression at Grade II Nepali for All (Government and Private) schools: at 90% level of significance

Variable	coef.	S. E.	p-value	90% C.I.	
Student factor (n = 216)					
std_cast1:					
Janajati	-0.776	0.530	0.144	-1.103	0.708
Dalit	0.079	0.933	0.932	-1.110	2.705
std_rlgn1	-0.981	0.300	0.001	-1.123	-0.408
Std_hw_prnt	-1.128	0.400	0.005	-1.878	-0.379
std_p_litra	-1.172	0.398	0.003	-2.012	-0.896
std_sex	0.376	0.258	0.147	-0.129	0.8831
Constant	0.585	0.941	0.534	-0.156	2.045
Log likelihood = -129.401, Pseudo R^2 = 0.086					
School factor (n = 246)					
hm_qulf:					
SLC	-0.490	0.740	0.534	-1.010	0.988
BA	-0.351	0.392	0.371	-1.102	1.034
MA	-0.558	0.869	0.521	-1.013	0.949
Nepdisnry	-1.602	0.713	0.025	-2.101	-0.996
all txt books	0.753	0.225	0.001	0.121	2.120
build_typ	0.407	0.154	0.008	0.149	0.966
Constant	-0.384	0.429	0.371	-0.833	0.464
Log likelihood = -148.649, Pseudo R^2 = 0.118					
Teacher factor (n = 242)					
tch_qulf					
SLC	-0.371	0.137	0.007	-1.021	- 0.287
BA	-0.456	0.193	0.020	-1.120	-0.208
MA	-0.436	0.201	0.030	-1.007	-0.158
tch_house	3.741	2.01	0.032	1.725	5.657
tch_train	-0.350	0.212	0.050	-0.713	-0.129
tch_exp	-1.121	0.572	0.050	-1.654	-0.588
Constant	-0.377	0.187	0.044	-1.230	- 0.113
Log likelihood = -143.106, Pseudo R^2 = 0.091					
Family factor (n = 98)					
hh_agr_land	0.437	0.22	0.049	0.012	1.990
hh_m_inc	-0.742	0.430	0.080	-1.010	-0.234
hh_mem_abord	0.190	0.407	0.641	-0.606	1.908
Hh_help_chld	0.308	0.609	0.614	-0.885	2.502
hh_occup:					
Daily Wages	0.111	0.912	0.990	-1.210	2.527
Service	1.914	0.990	0.056	1.012	2.012
Others	-0.703	0.520	0.180	-1.231	0.997
Constant	-0.58	0.631	0.360	-1.201	1.211
Log likelihood = -81.440, Pseudo R^2 = 0.110					

Dependent variable: pass/fail status of students through ASER score

Annex 2.2 (b) Multivariate Logistic Regression at Grade II Nepali for (Government) schools: at 90% level of significance

Variable	coef.	S. E.	p-value	90% C. I.	
Student factor (n = 93)					
std_hw_prnt	-2.192	0.801	0.007	-2.270	-0.947
std_rlgn1	-1.703	0.929	0.070	-2.056	-0.979
std_p_litra	-1.430	0.770	0.070	-2.310	-0.098
std_sex	0.978	0.769	0.206	-0.369	1.964
std_eth1:					
Janajati	-0.801	0.417	0.057	-1.259	-0.093
Dalit	-0.786	0.434	0.073	-1.142	-0.093
constant	0.978	0.786	0.216	-0.101	1.980
Log likelihood = -84.81, Pseudo R^2 = 0.092					
School factor (n = 124)					
hm_qulf:					
SLC	-0.345	0.190	0.071	-1.010	-0.198
BA	-0.403	0.191	0.040	-1.100	-0.192
MA	-0.418	0.151	0.006	-1.010	-0.129
calendr	-1.096	0.287	0.001	-1.343	-0.788
build_typ	0.879	0.341	0.010	0.107	1.937
all txt books	0.956	0.450	0.040	0.121	1.983
Libry_yes	-1.149	0.653	0.080	-1.321	-0.836
constant	0.874	0.696	0.211	-0.401	1.894
Log likelihood = --76.32 Pseudo R^2 = 0.312					
Teacher factor (n = 140)					
tch_cast1:					
Janajati	1.245	0.310	0.001	0.221	2.051
Dalit	1.314	0.551	0.020	0.210	2.345
tch_qulf:					
SLC	-0.388	0.171	0.024	-1.020	-0.138
BA	-0.534	0.189	0.006	-1.000	-0.239
MA	-0.638	0.289	0.029	-1.121	-0.342
tch_rlgn1	-2.989	0.956	0.002	-3.112	-0.969
tch_train	-0.639	0.259	0.014	-0.953	-0.170
tch_exp	0.099	0.098	0.311	-0.051	1.998
constant	-0.880	0.990	0.370	-1.403	1.249
Log likelihood = -73.916Pseudo R^2 = 0.0.076					
Family factor (n = 64)					
hh_occup:					
Daily Wages	0.197	0.101	0.053	0.112	1.213
Service	1.406	0.498	0.005	0.120	2.910
Others	-0.678	0.306	0.030	-1.920	-0.218
hh_m_inc	-0.356	0.150	0.020	-1.050	-0.178
hh_mem_abord	0.992	0.972	0.301	-0.110	2.941
hh_help_chld	-0.693	0.620	0.265	-1.909	1.530
constant	-0.589	0.622	0.345	-1.210	1.989
Log likelihood = -80.440, Pseudo R^2 = 0.101					

Dependent variable: pass/fail status of students through ASER score

Annex 2.3 (b) Multivariate Logistic regression at Grade II Math for All (Government and private) schools : at 90% level of significance

Variable	coef.	S. E.	p-value	90% C.I.	
Student factor (n = 168)					
std_p_litra	-1.589	0.371	0.001	-2.110	-0.865
Std_rlgn1	-0.923	0.280	0.001	-1.699	-0.208
std_sex	0.599	0.332	0.073	0.053	1.253
std_eth1					
Janajati	-1.023	0.370	0.006	-1.535	-0.754
Dalit	0.193	0.978	0.844	-1.162	2.981
Constant	0.091	0.050	0.070	-1.156	-0.011
Log likelihood = -91.509, Pseudo R^2 = 0.118					
School factor (n = 154)					
libry_yes	-1.114	0.873	0.206	-2.121	0.987
hm_age	0.063	0.033	0.060	0.001	0.944
all txt books	0.553	0.242	0.024	0.110	1.989
Engdisnry	-1.312	0.501	0.009	-2.341	-0.267
Constant	-0.094	0.437	0.830	-1.150	1.989
Log likelihood = -92.100, Pseudo R^2 = 0.412					
Teacher factor (n = 170)					
tch_age	0.048	0.022	0.030	0.021	0.921
tch_exp	-0.067	0.059	0.250	-0.111	0.903
tch_qulf					
SLC	-0.241	0.120	0.047	-1.010	- 0.110
BA	-0.322	0.160	0.046	-1.120	-0.112
MA	-0.226	0.105	0.032	-1.210	-0.103
tch_train	-0.850	0.410	0.040	-1.710	-0.149
tch_house	3.541	1.024	0.001	2.725	4.757
tch_exp	-1.867	0.941	0.050	-2.154	-0.120
Constant	-0.707	0.208	0.001	-3.500	-0.014
Log likelihood = -98.403, Pseudo R^2 = 0.110					
Family factor (n = 61)					
hh_agr_land	-1.102	0.486	0.027	-2.131	-0.898
hh_m_inc	-0.186	0.091	0.043	-1.010	- 0.012
hh_mem_abord	0.730	0.359	0.046	0.127	1.688
Hh_help_chld	-0.145	0.070	0.043	-1.387	-0.017
Hh_occup:					
Dw	0.102	0.050	0.045	0.021	1.527
Service	1.314	0.516	0.014	0.045	2.966
Others	-0.573	0.250	0.026	-1.919	-0.128
Constant	0.596	0.716	0.408	-0.101	2.522
Log likelihood = -34.671, Pseudo R^2 = 0.141					

Dependent variable: pass/fail status of students through ASER score

Annex 2.4 (b) Multivariate Logistic Regression at Grade II Math for (Government) schools : at 90% level of significance

Variable	coef.	S. E.	p-value	90% C.I.	
Student factor (n = 167)					
std_p_litra	-1.365	0.331	0.001	-2.033	- 0.138
std_sex	-0.177	0.090	0.052	-1.772	-0.017
std_eth1					
Janajati	-1.309	0.410	0.001	-2.101	-0.142
Dalit	0.240	0.378	0.561	-0.141	1.797
Constant	0.456	0.323	0.160	-0.121	1.989
Log likelihood = -139.014, Pseudo R^2 = 0.291					
School factor (n = 143)					
Calendr	-1.046	0.486	0.033	-2.103	-0.123
build_typ	0.053	0.030	0.080	0.013	1.234
Watr_yes	0.094	0.050	0.062	0.013	1.202
libry_yes	-1.157	0.243	0.001	-1.921	-0.207
all txt books	0.763	0.370	0.041	0.110	1.320
hm_age	0.173	0.080	0.032	0.002	1.134
Constant	-0.598	0.614	0.331	-1.110	0.012
Log likelihood = -90.150, Pseudo R^2 = 0.312					
Teacher factor (n = 168)					
tch_attend	-0.996	0.554	0.074	-1.985	-0.214
tch_qulf					
SLC	-0.341	0.160	0.034	-1.012	-0.127
BA	-0.323	0.161	0.047	-1.140	-0.140
MA	-0.326	0.160	0.043	-1.210	-0.121
tch_train	-0.479	0.211	0.024	-0.710	- 0.129
tch_exp	0.037	0.010	0.002	0.014	0.799
Tch_age	0.057	0.015	0.001	0.025	0.092
Constant	-0.060	0.020	0.003	-0.318	-0.302
Log likelihood = -105.403, Pseudo R^2 = 0.112					
Family factor (n = 63)					
hh_mem_abord	0.832	0.493	0.096	0.134	1.799
Hh_help_chld	-0.902	0.534	0.096	-1.117	-0.136
hh_agr_land	-1.302	0.412	0.002	-2.831	-0.112
hh_m_inc	-0.245	0.102	0.019	-1.021	0.011
Constant	0.566	0.438	0.201	-0.112	1.160
Log likelihood = -59.541, Pseudo R^2 = 0.152					

Dependent variable: pass/fail status of students through ASER score

Annex 2.5 (b) Multivariate Logistic Regression for Grade IV Nepali for All (Government and Private) schools: at 90% level of significance

Variable	coef.	S. E.	p-value	90% C.I.	
Student factor (n = 235)					
std_sex	-0.140	0.263	0.595	-0.656	1.976
std_eth1					
Janajati	-1.289	0.510	0.012	-1.821	-0.149
Dalit	0.121	0.050	0.016	0.012	1.131
std_p_litra	-1.446	0.433	0.001	-2.103	- 0.121
Constant	0.547	0.342	0.111	-1.118	0.989
Log likelihood = -154.014, Pseudo R^2 = 0.221					
School factor (n = 229)					
build_typ	0.031	0.027	0.255	-0.513	0.897
Watr_yes	0.715	0.333	0.033	0.331	1.987
libry_yes	-0.365	0.157	0.021	-0.991	-0.027
all txt books	0.953	0.382	0.013	0.112	1.720
Constant	0.845	0.388	0.031	0.206	1.354
Log likelihood = -154.64, Pseudo R^2 = 0.143					
Teacher factor (n = 170)					
tch_sex	0.910	0.194	0.001	0.321	1.920
tch_qulf					
SLC	-0.141	0.610	0.022	-1.010	-0.027
BA	-0.403	0.201	0.047	-1.120	-0.179
MA	-0.325	0.132	0.014	-1.210	-0.131
tch_attend	-0.995	0.344	0.004	-1.185	-0.110
tch_train	-0.478	0.211	0.024	-0.710	-0.127
tch_exp	-0.141	0.081	0.083	1.037	-0.012
Constant	-0.098	0.478	0.837	-1.198	1.327
Log likelihood = -110.463, Pseudo R^2 = 0.182					
Family factor (n = 95)					
hh_incomey	0.453	0.208	0.030	0.120	1.987
Hh_help_chld	-0.645	0.434	0.139	-1.187	2.047
hh_agr_land	-1.822	0.450	0.001	-2.131	-0.119
hh_mem_abord	0.397	0.202	0.050	0.146	1.841
Constant	-0.005	0.407	0.990	-1.721	3.997
Log likelihood = -50.641, Pseudo R^2 = 0.101					

Dependent variable: pass/fail status of students through ASER score

Annex 2.6 (b) Multivariate Logistic Regression for Grade IV Nepali for (Government) schools: at 90% level of significance

Variable	coef.	S. E.	p-value	90% C.I.	
Student factor (n = 235)					
std_sex	-0.140	0.099	0.159	-0.656	1.126
std_eth1					
Janajati	-1.289	0.410	0.002	-1.981	-0.149
Dalit	0.121	0.061	0.048	0.007	1.298
std_p_litra	-1.446	0.433	0.001	-2.103	- 0.119
Constant	0.547	0.242	0.025	0.118	0.989
Log likelihood = -154.014, Pseudo R^2 = 0.221					
School factor (n = 229)					
build_typ	0.031	0.020	0.123	-0.513	0.897
Watr_yes	0.715	0.333	0.033	0.331	1.987
libry_yes	-0.365	0.099	0.001	-1.940	-0.123
all txt books	0.953	0.399	0.020	0.112	2.120
Constant	0.845	0.588	0.154	-0.206	1.954
Log likelihood = -154.64, Pseudo R^2 = 0.143					
Teacher factor (n = 170)					
tch_sex	0.910	0.494	0.067	0.321	2.120
tch_qulf					
SLC	-0.141	0.070	0.046	-1.210	-0.012
BA	-0.403	0.200	0.045	-1.120	-0.173
MA	-0.325	0.160	0.044	-1.210	-0.129
tch_attend	-0.995	0.354	0.005	-1.185	-0.110
tch_train	-0.478	0.211	0.024	-0.710	-0.147
tch_exp	-0.141	0.080	0.080	-1.037	- 0.012
Constant	-0.098	0.478	0.837	-0.198	1.892
Log likelihood = -110.463, Pseudo R^2 = 0.182					
Family factor (n = 95)					
hh_incomey	0.453	0.178	0.012	0.113	1.687
Hh_help_chld	-0.645	0.434	0.140	-1.187	2.047
hh_agr_land	-1.822	0.522	0.001	-2.131	-0.119
hh_mem_abord	0.397	0.221	0.075	0.146	1.841
Constant	-0.005	0.407	0.990	-1.721	2.997
Log likelihood = -50.641, Pseudo R^2 = 0.101					

Dependent variable: pass/fail status of students through ASER score

Annex 2.7 (b) Multivariate Logistic Regression at Grade IV Math for All (Government and Private) schools: at 90% level of significance

Variable	coef.	S. E.	p-value	90% C.I.	
Student factor (n = 235)					
std_eth1:					
Janajati	-1.149	0.360	0.002	- 2.101	- 0.959
Dalit	0.129	0.064	0.045	0.106	1.304
std_p_litra	-1.206	0.408	0.004	-2.103	- 0.139
std_sex	0.134	0.067	0.050	0.012	1.256
Constant	0.376	0.152	0.014	0.118	0.998
Log likelihood = -150.123, Pseudo R^2 = 0.298					
School factor (n = 223)					
Watr_yes	0.864	0.504	0.087	0.231	1.989
hm_sex	-2.007	1.030	0.052	- 4.027	- 0.012
Nepdisnry	-2.584	1.025	0.012	- 4.629	- 0.169
build_typ	0.780	0.311	0.013	0.110	1.987
all txt books	0.853	0.387	0.030	0.141	1.989
Constant	-1.450	0.426	0.001	-1.955	-1.041
loglikelihood = 120.451, Pseudo R^2 = 0.392					
Teacher factor (n = 212)					
tch_qulf:					
SLC	-0.162	0.073	0.030	-1.920	-0.079
BA	-0.245	0.118	0.040	-1.120	-0.102
MA	-0.426	0.207	0.041	-1.112	-0.079
tch_house	2.781	1.019	0.006	1.125	6.797
tch_exp	0.097	0.034	0.0047	0.012	1.091
tch_eth					
Janajati	1.511	0.755	0.046	0.322	1.969
Dalit	1.116	0.555	0.050	0.125	1.923
Constant	-1.734	0.538	0.001	-4.900	-1.014
Log likelihood =-100.210 , Pseudo R^2 = 0.392					
Family factor (n = 94)					
hh_mem_abord	0.122	0.061	0.048	0.021	1.987
Hh_help_chld	0.223	0.112	0.050	0.131	2.410

Dependent variable: pass/fail status of students through ASER score

Annex 2.8 (b) Multivariate Logistic Regression at Grade IV Math for (Government) schools : at 90% level of significance

Variable	coef.	S. E.	p-value	90% C.I.	
Student factor (n = 167)					
std_p_litra	-1.436	0.437	0.001	-2.103	- 0.139
std_sex	0.426	0.215	0.049	0.120	1.978
std_eth:					
Janajati	-1.159	0.388	0.003	-1.921	- 0.128
Dalit	0.149	0.075	0.049	0.012	1.974
Constant	0.269	0.136	0.050	0.122	0.996
Log likelihood = - 140.341, Pseudo R^2 = 0.302					
School factor (n = 161)					
Watr_yes	0.899	0.449	0.047	0.456	2.034
libry_yes	-0.123	0.062	0.050	-0.732	-0.012
buid_type	2.638	1.909	0.04	0.740	5.896
Calendr	-1.543	0.286	0.001	-1.991	-0.123
all txt books	0.453	0.167	0.007	0.131	1.989
Constant	-6.011	1.225	0.001	- 8.071	-2.260
Log likelihood = - 40.082, Pseudo R^2 = 0.182					
Teacher factor (n = 178)					
tch_exp	0.069	0.027	0.013	0.002	0.987
tch_house	2.741	1.021	0.007	1.120	4.707
tch_qulf:					
SLC	-0.211	0.087	0.017	-1.150	-0.123
BA	-0.422	0.183	0.022	-1.121	-0.209
MA	-0.526	0.250	0.037	-1.153	-0.201
tch_train	-0.970	0.201	0.001	-1.411	-0.167
tch_age	0.102	0.036	0.005	0.033	0.192
Constant	-4.921	0.769	0.001	-5.402	-1.430
Log likelihood = - 42.507, Pseudo R^2 = 0.189					
Family factor (n = 54)					
Hh_help_chld	-0.182	0.091	0.051	-1.875	-0.012
hh_agr_land	-1.392	0.618	0.028	-2.101	-0.119
hh_m_inc	-0.369	0.166	0.030	-1.010	-0.130
hh_mem_abord	0.617	0.293	0.040	0.198	2.101
Constant	-0.003	0.517	0.995	-0.421	1.919
Log likelihood = 56.342 , Pseudo R^2 = 0.194					

Dependent variable: pass/fail status of students through ASER score

Annex - 3.1 (C) Percentage Pass Rate on Grade-II of Tested Students by Subject (Nepali and Maths) by school types and Eco-belts (TOTAL= Government and Private schools)

School by Types	Eco-belts	NEP_SCOR1 Alphabet	NEP_SCOR2 Word	nep_pass_2 PASS	NEP_SCOR3 Text Paragraph-I	NEP_SCOR4 Text Paragraph-II	NEP_SCOR5 Story	MATH_SCOR1 Number (1-9)	MATH_SCOR2 Number (11-99)	Math_pass_2 PASS	MATH_SCOR3 Subtraction	MATH_SCOR4 Division
Government	Mountain	100.0	54.2	54.2	12.5	12.5	0.0	100.0	20.8	20.8	0.0	0.0
	Hills	54.2	28.8	28.8	16.9	18.6	13.6	81.4	33.9	33.9	1.7	0.0
	KTM valley	80.6	51.6	51.6	38.7	25.8	22.6	83.9	41.9	41.9	0.0	0.0
	Tarai	70.0	33.3	33.3	11.7	21.7	16.7	86.7	28.3	28.3	5.0	5.0
	Total	*70.7*	*37.9*	*37.9*	*18.4*	*20.1*	*14.4*	*86.2*	*31.6*	*31.6*	*2.3*	*1.7*
Private	Mountain	100.0	100.0	100.0	80.0	0.0	0.0	100.0	20.0	20.0	0.0	0.0
	Hills	90.0	60.0	60.0	36.7	36.7	26.7	96.7	66.7	66.7	3.3	3.3
	KTM valley	94.1	70.6	70.6	47.1	52.9	41.2	100.0	100.0	100.0	5.9	0.0
	Tarai	100.0	90.0	90.0	60.0	60.0	55.0	100.0	75.0	75.0	40.0	40.0
	Total	*94.4*	*73.6*	*73.6*	*48.6*	*44.4*	*36.1*	*98.6*	*73.6*	*73.6*	*13.9*	*12.5*
TOTAL	Mountain	100.0	62.1	62.1	24.1	10.3	0.0	100.0	20.7	20.7	0.0	0.0
	Hills	66.3	39.3	39.3	23.6	24.7	18.0	86.5	44.9	44.9	2.2	1.1
	KTM valley	85.4	58.3	58.3	41.7	35.4	29.2	89.6	62.5	62.5	2.1	0.0
	Tarai	77.5	47.5	47.5	23.8	31.3	26.3	90.0	40.0	40.0	13.8	13.8
	Total	77.6	48.4	48.4	27.2	27.2	20.7	89.8	43.9	43.9	5.7	4.9

Annex - 3.2 (C) Percentage Pass Rate on Grade-II by Subject (Nepali and Maths) by Eco-belts with Gender

Eco-belts	Gender	NEP_SCOR1	NEP_SCOR2	nep_pass_2	NEP_SCOR3	NEP_SCOR4	NEP_SCOR5	MATH_SCOR1	MATH_SCOR2	Math_pass_2	MATH_SCOR3	MATH_SCOR4
		Alphabet	Word	PASS	Text Paragraph-I	Text Paragraph-II	Story	Number (1-9)	Number (11-99)	PASS	Subtraction	Division
Mountain	**Boy**	100.0	45.5	45.5	9.1	9.1	0.0	100.0	18.2	18.2	0.0	0.0
	Girl	100.0	61.5	61.5	15.4	15.4	0.0	100.0	23.1	23.1	0.0	0.0
	Total	100.0	54.2	54.2	12.5	12.5	0.0	100.0	20.8	20.8	0.0	0.0
Hills	**Boy**	59.0	35.9	35.9	23.1	25.6	17.9	87.2	41.0	41.0	2.6	0.0
	Girl	45.0	15.0	15.0	5.0	5.0	5.0	70.0	20.0	20.0	0.0	0.0
	Total	54.2	28.8	28.8	16.9	18.6	13.6	81.4	33.9	33.9	1.7	0.0
KTM valley	**Boy**	91.7	66.7	66.7	58.3	25.0	16.7	75.0	50.0	50.0	0.0	0.0
	Girl	73.7	42.1	42.1	26.3	26.3	26.3	89.5	36.8	36.8	0.0	0.0
	Total	80.6	51.6	51.6	38.7	25.8	22.6	83.9	41.9	41.9	0.0	0.0
Tarai	**Boy**	71.4	35.7	35.7	7.1	21.4	17.9	92.9	35.7	35.7	3.6	3.6
	Girl	68.8	31.3	31.3	15.6	21.9	15.6	81.3	21.9	21.9	6.3	6.3
	Total	70.0	33.3	33.3	11.7	21.7	16.7	86.7	28.3	28.3	5.0	5.0
Total	**Boy**	72.2	41.1	41.1	21.1	22.2	15.6	88.9	37.8	37.8	2.2	1.1
	Girl	69.0	34.5	34.5	15.5	17.9	13.1	83.3	25.0	25.0	2.4	2.4
	Total	**70.7**	**37.9**	**37.9**	**18.4**	**20.1**	**14.4**	**86.2**	**31.6**	**31.6**	**2.3**	**1.7**

Annex - 3.3 (C) Percentage Pass Rate on Grade-II by Subject (Nepali and Maths) by Ethnicity with Gender

Ethnic Group	Gender	NEP_SCOR1 Alphabet	NEP_SCOR2 Word	Nep_pass_2 PASS	NEP_SCOR3 Text Paragraph-I	NEP_SCOR4 Text Paragraph-II	NEP_SCOR5 Story	MATH_SCOR1 Number (1-9)	MATH_SCOR2 Number (11-99)	Math_pass_2 PASS	MATH_SCOR3 Subtraction	MATH_SCOR4 Division
Mainstream	**Boy**	83.9	58.1	58.1	35.5	38.7	22.6	93.5	48.4	48.4	6.5	3.2
	Girl	80.6	51.6	51.6	19.4	25.8	16.1	93.5	32.3	32.3	6.5	6.5
	Total	82.3	54.8	54.8	27.4	32.3	19.4	93.5	40.3	40.3	6.5	4.8
Dalit	**Boy**	80.0	50.0	50.0	20.0	30.0	30.0	100.0	70.0	70.0	0.0	0.0
	Girl	81.8	54.5	54.5	18.2	18.2	9.1	90.9	36.4	36.4	0.0	0.0
	Total	81.0	52.4	52.4	19.0	23.8	19.0	95.2	52.4	52.4	0.0	0.0
Janajati	**Boy**	63.3	28.6	28.6	12.2	10.2	8.2	83.7	24.5	24.5	0.0	0.0
	Girl	57.1	16.7	16.7	11.9	11.9	11.9	73.8	16.7	16.7	0.0	0.0
	Total	60.4	23.1	23.1	12.1	11.0	9.9	79.1	20.9	20.9	0.0	0.0
Total	**Boy**	72.2	41.1	41.1	21.1	22.2	15.6	88.9	37.8	37.8	2.2	1.1
	Girl	69.0	34.5	34.5	15.5	17.9	13.1	83.3	25.0	25.0	2.4	2.4
	Total	**70.7**	**37.9**	37.9	**18.4**	**20.1**	**14.4**	**86.2**	**31.6**	31.6	**2.3**	**1.7**

Annex - 3.4 (C) Percentage Pass Rate on Grade-II by Subject (Nepali and Maths) by Districts with Gender

DISTRCT	Gender	NEP_SCOR1 Alphabet	NEP_SCOR2 Word	Nep_pass_2 PASS	NEP_SCOR3 Text Paragraph-I	NEP_SCOR4 Text Paragraph-II	NEP_SCOR5 Story	MATH_SCOR1 Number (1-9)	MATH_SCOR2 Number (11-99)	Math_pass_2 PASS	MATH_SCOR3 Subtraction	MATH_SCOR4 Division
Banke	Boy	50.0	42.9	**42.9**	7.1	35.7	28.6	92.9	50.0	**50.0**	7.1	7.1
	Girl	62.5	25.0	**25.0**	18.8	31.3	31.3	81.3	31.3	**31.3**	12.5	12.5
	Total	56.7	33.3	**33.3**	13.3	33.3	30.0	86.7	40.0	**40.0**	10.0	10.0
Chitwan	Boy	92.9	28.6	**28.6**	7.1	7.1	7.1	92.9	21.4	**21.4**	0.0	0.0
	Girl	75.0	37.5	**37.5**	12.5	12.5	0.0	81.3	12.5	**12.5**	0.0	0.0
	Total	83.3	33.3	**33.3**	10.0	10.0	3.3	86.7	16.7	**16.7**	0.0	0.0
Humla	Boy	100.0	45.5	**45.5**	9.1	9.1	0.0	100.0	18.2	**18.2**	0.0	0.0
	Girl	100.0	61.5	**61.5**	15.4	15.4	0.0	100.0	23.1	**23.1**	0.0	0.0
	Total	100.0	54.2	**54.2**	12.5	12.5	0.0	100.0	20.8	**20.8**	0.0	0.0
Ilam	Boy	40.9	9.1	**9.1**	0.0	0.0	0.0	81.8	18.2	**18.2**	0.0	0.0
	Girl	30.8	0.0	**0.0**	0.0	0.0	0.0	69.2	7.7	**7.7**	0.0	0.0
	Total	37.1	5.7	**5.7**	0.0	0.0	0.0	77.1	14.3	**14.3**	0.0	0.0
Kaski	Boy	82.4	70.6	**70.6**	52.9	58.8	41.2	94.1	70.6	**70.6**	5.9	0.0
	Girl	71.4	42.9	**42.9**	14.3	14.3	14.3	71.4	42.9	**42.9**	0.0	0.0
	Total	79.2	62.5	**62.5**	41.7	45.8	33.3	87.5	62.5	**62.5**	4.2	0.0
Kathmandu	Boy	91.7	66.7	**66.7**	58.3	25.0	16.7	75.0	50.0	**50.0**	0.0	0.0
	Girl	73.7	42.1	**42.1**	26.3	26.3	26.3	89.5	36.8	**36.8**	0.0	0.0
	Total	80.6	51.6	**51.6**	38.7	25.8	22.6	83.9	41.9	**41.9**	0.0	0.0
Total	Boy	72.2	41.1	**41.1**	21.1	22.2	15.6	88.9	37.8	**37.8**	2.2	1.1
	Girl	69.0	34.5	**34.5**	15.5	17.9	13.1	83.3	25.0	**25.0**	2.4	2.4
	Total	70.7	37.9	**37.9**	18.4	20.1	14.4	86.2	31.6	**31.6**	2.3	1.7

Annex - 3.5 (C) Percentage Pass Rate on the ASER TEST Score on Grade-IV by Subject (Nepali and Maths) by school types and Eco-belts

Types of School (Gov. /Pvt.)	ECO_REG	NEP_SCOR1	NEP_SCOR2	NEP_SCOR3	NEP_SCOR4	NEP_SCOR5	Nep_pass_4	MATH_SCOR1	MATH_SCOR2	MATH_SCOR3	MATH_SCOR4	Math_pass_4
		Alphabet	Word	Text Paragraph-I	Text Paragraph-II	Story	PASS	Number (1-9)	Number (11-99)	Subtraction	Division	PASS
Government	Mountain	100.0	100.0	80.0	75.0	60.0	60.0	100.0	75.0	5.0	0.0	0.0
	Hills	95.6	77.9	52.9	52.9	47.1	44.1	94.1	55.9	22.1	4.4	2.9
	KTM valley	87.1	77.4	54.8	51.6	45.2	45.2	100.0	61.3	22.6	6.5	6.5
	Tarai	79.7	93.2	76.3	84.7	78.0	74.6	96.6	93.2	45.8	32.2	25.4
	Total	*89.3*	*85.4*	*64.0*	*65.7*	*58.4*	*56.2*	*96.6*	*71.3*	*28.1*	*13.5*	*10.7*
Private	Mountain	100.0	100.0	20.0	20.0	20.0	20.0	100.0	60.0	20.0	0.0	0.0
	Hills	93.3	93.3	86.7	86.7	83.3	83.3	96.7	93.3	70.0	46.7	40.0
	KTM valley	100.0	100.0	93.8	93.8	87.5	87.5	100.0	100.0	37.5	12.5	12.5
	Tarai	77.8	66.7	55.6	55.6	55.6	55.6	100.0	77.8	61.1	27.8	22.2
	Total	*91.3*	*88.4*	*75.4*	*75.4*	*72.5*	*72.5*	*98.6*	*88.4*	*56.5*	*30.4*	*26.1*
Total	Mountain	100.0	100.0	68.0	64.0	52.0	52.0	100.0	72.0	8.0	0.0	0.0
	Hills	94.9	82.7	63.3	63.3	58.2	56.1	94.9	67.3	36.7	17.3	14.3
	KTM valley	91.5	85.1	68.1	66.0	59.6	59.6	100.0	74.5	27.7	8.5	8.5
	Tarai	79.2	87.0	71.4	77.9	72.7	70.1	97.4	89.6	49.4	31.2	24.7
	Total	89.9	86.2	67.2	68.4	62.3	60.7	97.2	76.1	36.0	18.2	15.0

Annex - 3.6 (C) Percentage Pass Rate on the ASER TEST Score on Grade-IV by Subject (Nepali and Maths) by Eco-belts and Gender

Eco-belts	Gender	NEP_SCOR1 Alphabet	NEP_SCOR2 Word	NEP_SCOR3 Text Paragraph-I	NEP_SCOR4 Text Paragraph-II	NEP_SCOR5 Story	Nep_pass_4 PASS	MATH_SCOR1 Number (1-9)	MATH_SCOR2 Number (11-99)	MATH_SCOR3 Subtraction	MATH_SCOR4 Division	Math_pass_4 PASS
Mountain	Boy	100.0	45.5	45.5	9.1	9.1	0.0	100.0	18.2	18.2	0.0	0.0
	Girl	100.0	61.5	61.5	15.4	15.4	0.0	100.0	23.1	23.1	0.0	0.0
	Total	100.0	54.2	54.2	12.5	12.5	0.0	100.0	20.8	20.8	0.0	0.0
Hills	Boy	59.0	35.9	35.9	23.1	25.6	17.9	87.2	41.0	41.0	2.6	0.0
	Girl	45.0	15.0	15.0	5.0	5.0	5.0	70.0	20.0	20.0	0.0	0.0
	Total	54.2	28.8	28.8	16.9	18.6	13.6	81.4	33.9	33.9	1.7	0.0
KTM valley	Boy	91.7	66.7	66.7	58.3	25.0	16.7	75.0	50.0	50.0	0.0	0.0
	Girl	73.7	42.1	42.1	26.3	26.3	26.3	89.5	36.8	36.8	0.0	0.0
	Total	80.6	51.6	51.6	38.7	25.8	22.6	83.9	41.9	41.9	0.0	0.0
Tarai	Boy	71.4	35.7	35.7	7.1	21.4	17.9	92.9	35.7	35.7	3.6	3.6
	Girl	68.8	31.3	31.3	15.6	21.9	15.6	81.3	21.9	21.9	6.3	6.3
	Total	70.0	33.3	33.3	11.7	21.7	16.7	86.7	28.3	28.3	5.0	5.0
Total	Boy	72.2	41.1	41.1	21.1	22.2	15.6	88.9	37.8	37.8	2.2	1.1
	Girl	69.0	34.5	34.5	15.5	17.9	13.1	83.3	25.0	25.0	2.4	2.4
	Total	70.7	37.9	37.9	18.4	20.1	14.4	86.2	31.6	31.6	2.3	1.7

Annex - 3.7 (C) Percentage Pass Rate on the ASER TEST Score on Grade-IV by Subject (Nepali and Maths) by Ethnicity and Gender

Ethnic Group	Gender	NEP_SCOR1 Alphabet	NEP_SCOR2 Word	NEP_SCOR3 Text Paragraph-I	NEP_SCOR4 Text Paragraph-II	NEP_SCOR5 Story	Nep_pass_4 PASS	MATH_SCOR1 Number (1-9)	MATH_SCOR2 Number (11-99)	MATH_SCOR3 Subtraction	MATH_SCOR4 Division	Math_pass_4 PASS
Main Stream	Boy	78.8	84.8	75.8	81.8	66.7	66.7	97.0	87.9	42.4	30.3	27.3
	Girl	80.0	86.7	70.0	70.0	63.3	56.7	90.0	66.7	26.7	16.7	10.0
	Total	79.4	85.7	73.0	76.2	65.1	61.9	93.7	77.8	34.9	23.8	19.0
Dalit	Boy	100.0	81.8	45.5	45.5	45.5	45.5	100.0	81.8	18.2	0.0	0.0
	Girl	100.0	92.9	71.4	78.6	64.3	64.3	100.0	85.7	35.7	28.6	14.3
	Total	100.0	88.0	60.0	64.0	56.0	56.0	100.0	84.0	28.0	16.0	8.0
Janajati	Boy	94.3	83.0	56.6	56.6	50.9	49.1	96.2	66.0	24.5	5.7	5.7
	Girl	91.9	86.5	62.2	62.2	59.5	56.8	100.0	59.5	21.6	5.4	5.4
	Total	93.3	84.4	58.9	58.9	54.4	52.2	97.8	63.3	23.3	5.6	5.6
Total	Boy	89.7	83.5	61.9	63.9	55.7	54.6	96.9	75.3	29.9	13.4	12.4
	Girl	88.9	87.7	66.7	67.9	61.7	58.0	96.3	66.7	25.9	13.6	8.6
	Total	89.3	85.4	64.0	65.7	58.4	56.2	96.6	71.3	28.1	13.5	10.7

Annex - 3.8 (C) Percentage Pass Rate on the ASER TEST Score on Grade-IV by Subject (Nepali and Maths) by Districts and Gender

DISTRCT	Gender	NEP_SCOR1 Alphabet	NEP_SCOR2 Word	NEP_SCOR3 Text Paragraph-I	NEP_SCOR4 Text Paragraph-II	NEP_SCOR5 Story	Nep_pass_4 PASS	MATH_SCOR1 Number (1-9)	MATH_SCOR2 Number (11-99)	MATH_SCOR3 Subtraction	MATH_SCOR4 Division	Math_pass_4 PASS
Banke	Boy	64.7	82.4	70.6	82.4	76.5	70.6	94.1	94.1	70.6	64.7	58.8
	Girl	53.8	92.3	84.6	92.3	92.3	84.6	92.3	84.6	38.5	46.2	23.1
	Total	*60.0*	*86.7*	*76.7*	*86.7*	*83.3*	*76.7*	*93.3*	*90.0*	*56.7*	*56.7*	*43.3*
Chitwan	Boy	100.0	100.0	75.0	81.3	68.8	68.8	100.0	93.8	31.3	6.3	6.3
	Girl	100.0	100.0	76.9	84.6	76.9	76.9	100.0	100.0	38.5	7.7	7.7
	Total	*100.0*	*100.0*	*75.9*	*82.8*	*72.4*	*72.4*	*100.0*	*96.6*	*34.5*	*6.9*	*6.9*
Humla	Boy	100.0	100.0	75.0	75.0	66.7	66.7	100.0	91.7	8.3	0.0	0.0
	Girl	100.0	100.0	87.5	75.0	50.0	50.0	100.0	50.0	0.0	0.0	0.0
	Total	*100.0*	*100.0*	*80.0*	*75.0*	*60.0*	*60.0*	*100.0*	*75.0*	*5.0*	*0.0*	*0.0*
Ilam	Boy	89.5	68.4	42.1	42.1	36.8	36.8	100.0	42.1	15.8	0.0	0.0
	Girl	100.0	77.8	44.4	50.0	50.0	44.4	100.0	44.4	16.7	0.0	0.0
	Total	*94.6*	*73.0*	*43.2*	*45.9*	*43.2*	*40.5*	*100.0*	*43.2*	*16.2*	*0.0*	*0.0*
Kaski	Boy	100.0	80.0	60.0	60.0	46.7	46.7	86.7	66.7	20.0	0.0	0.0
	Girl	93.8	87.5	68.8	62.5	56.3	50.0	87.5	75.0	37.5	18.8	12.5
	Total	*96.8*	*83.9*	*64.5*	*61.3*	*51.6*	*48.4*	*87.1*	*71.0*	*29.0*	*9.7*	*6.5*
Kathmandu	Boy	88.9	77.8	55.6	50.0	44.4	44.4	100.0	72.2	27.8	5.6	5.6
	Girl	84.6	76.9	53.8	53.8	46.2	46.2	100.0	46.2	15.4	7.7	7.7
	Total	*87.1*	*77.4*	*54.8*	*51.6*	*45.2*	*45.2*	*100.0*	*61.3*	*22.6*	*6.5*	*6.5*
Total	Boy	89.7	83.5	61.9	63.9	55.7	54.6	96.9	75.3	29.9	13.4	12.4
	Girl	88.9	87.7	66.7	67.9	61.7	58.0	96.3	66.7	25.9	13.6	8.6
	Total	*89.3*	*85.4*	*64.0*	*65.7*	*58.4*	*56.2*	*96.6*	*71.3*	*28.1*	*13.5*	*10.7*

School Level Questionnaire

4.1 (D) Identification

SN	Question		
1.1	DOE Code No: SERP sample code no:		
1.2	Name of the School Telephone: School Established Date: Primary School Temporary / Provisional Date: Primary School Permanent Date:		
1.3	Development Regions	a) Eastern b) Central c) Western e) Mid Westerm f) Far Western g) Kathmandu Valley	
1.4	Ecological Zones	a) Mountain b) Hill c) Terai	
1.5	District	Name	
1.6	VDC/Municiapality		
	Ward No.		
	Tole		
1.7	Types of School	a) Community (Aided)	
		b) Community (Unaided)	
		c) Community (Management transferred)	
		d) Private School	
	Owenrship of school presise/ property.	1. Public Land 2. Board Member/Founder Principal/ Investors 3. School 4. Other	

	Date of Interview	dd/mm/yy
	Name of the Interviewee	Email: Telephone
	Person Entering the Data	Email: Telephone
	Date of Data Entry	dd/mm/yy

4.2 (D) Questions on the Health, Nutrition status and Admission of the students:

	Some questions on the health and nutrition status of the students				
2.1	If there are malnutrition students, how many are reported to be so?	no. students	Boy	Girls	Total
2.2	Kindly provide number of students who are immunized?	no. students	Male: Female: ERR Janjatis: Dalits:		
	Some questions on the student admission procedure				
2.3	What documents do you seek from the students at the time of their admissions?	1. Birth certificate 2. Mark sheet of latest grade exam 3. Citizenship certificate of parents 4. Others			
2.4	Do you deny them admissions if the documents are not available?	1 – yes 2 - no			
2.5	If yes, how do you think children can access education facilities?	1. go to other school 2. go to other areas for schooling 3. others			
2.6	If no, how do you adjust to the absence of the birth certificate and the absence of citizenship certificate of the parents?	1. Get recommendation from VDC / municipality 2. provisional admission granted 3. others			
2.7	If no, how do you adjust to the absence of the mark sheet of the earlier grade?	1. taking entrance examination 2. interview of the students 3. others			

2.8	Do you always use an entrance exam?		
2.9	In what way has the current conflict (political sttuation) affected the student admission?	1. Not affected 2. Reduced the admission 3. Increased the admission	
2.10	If admission has gone down, what have the students done?	1. students moved to less disturbed areas even to India, abroad 2. stopped coming to school 3. joined the labor force 4. joined local politics	#1: #2 : #3 :

4.3 (D) Student Enrolment:

(To be taken from School Admission Register)

4.3.1 Provide the Number of New Entrance of Age-5 at EDC/PPC students in school Year 2068.

Grade	**No. of Students**		
Grade-1	**Girls**	**Boys**	**Total**
New entrance in grade one with the experience of ECD/PPC			

4.3.2 TOTAL Primary level students

SN	Students/Grade	Pre Primary	Grade-1	Grade-2	Grade-3	Grade-4	Grade-5	Total
3.1.1	Boys							
3.1.2	Girls							
	Total							

4.3.3 Primary level Dalit[1] students

SN	Students/Grade	Pre Primary	Grade-1	Grade-2	Grade-3	Grade-4	Grade-5	Total
3.2.1	Boys							
3.2.2	Girls							
	Total							

4.3.4 Primary level Marginalized Janjati[2] students

SN	Students/Grade	Pre Primary	Grade-1	Grade-2	Grade-3	Grade-4	Grade-5	Total
3.3.1	Boys							
3.3.2	Girls							
	Total							

4.3.5 Primary level Disabled students

SN	Students/Grade	Pre Primary	Grade-1	Grade-2	Grade-3	Grade-4	Grade-5	Total
3.1.1	Boys							
2.3.2	Girls							
	Total							

4.4 (D) Provide the status on record of attendance of 15 Days before (to be observed from School Attendance Register)

4.4.1 Total Primary level students

SN	Students/Grade	Pre Primary	Grade-1	Grade-2	Grade-3	Grade-4	Grade-5	Total
3.2.1	Boys							
3.2.2	Girls							
	Total							

[1] Dalit: refers to total 23 castes Lohar, Sunar, Kami, Damai, Sarki, Badi, Gaine, Kasai, Kusle, Kuche, Chayme, Pode, Chamar, Dhobi, Pasawan (Dusadh), Tatma, Dom, Batar, Khatwe, Mushahar, Santhal, Satar and Halakhor

[2] Highly Marginalized groups includes: Bankariya, Kusunda, Kushbadiya, Raute, Surel Hayu, Raji, Kisan, Lepcha, Meche, Santhal, Jhangad, Chepang, Thami, Majhi, Bote, Dhanuk (Rajbansi), Lhomi (Singsawa), Thudamba, Siyar (Chumba), Baramu, Danuwar. It is a combination of Endangered and highly margainalized groups categorized by Nepal Federation of Indigenours Nationalities

4.4.2 Primary level Dalit students

SN	Students/Grade	Pre Primary	Grade-1	Grade-2	Grade-3	Grade-4	Grade-5	Total
3.2.3	Boys							
3.2.4	Girls							
	Total							

4.4.3 Primary level Marginalized Janjati students

SN	Students/Grade	Pre Primary	Grade-1	Grade-2	Grade-3	Grade-4	Grade-5	Total
3.2.5	Boys							
3.2.6	Girls							
	Total							

4.4.4 Primary level Disabled students

SN	Students/Grade	Pre Primary	Grade-1	Grade-2	Grade-3	Grade-4	Grade-5	Total
3.2.7	Boys							
3.2.8	Girls							
	Total							

4.5 (D) HEAD COUNT DURING THE SCHOOL-VISIT DAY:

4.5.1 Total Primary level students (Head Count- during the school Visit Day)

SN	Students/Grade	Pre Primary	Grade-1	Grade-2	Grade-3	Grade-4	Grade-5	Total
3.3.1	Boys							
3.3.2	Girls							
	Total							

4.5.2 Primary level Dalit students (Head Count- during the school Visit Day)

SN	Students/Grade	Pre Primary	Grade1	Grade-2	Grade-3	Grade-4	Grade-5	Total
3.3.3	Boys							
3.3.4	Girls							
	Total							

4.5.3 Primary level Marginalized Janjati students (Head Count- during the school Visit Day)

SN	Students/Grade	Pre Primary	Grade-1	Grade-2	Grade-3	Grade-4	Grade-5	Total
3.3.5	Boys							
3.3.6	Girls							
	Total							

4.5.4 Primary level Disabled student (Head Count- during the school Visit Day)

SN	Students/Grade	Pre Primary	Grade-1	Grade-2	Grade-3	Grade-4	Grade-5	Total
3.3.7	Boys							
3.3.8	Girls							
	Total							

5.5 (D) Free Textbook distribution 2068 School Year

S. No	**Question**		
7.1.1	Did you receive free textbook grants budget for primary level before starting the school session ?	a. Yes b. No	
7.1.2	If No, how do you manage for purchase of Textbooks? Please mention one	a. From other budget head b. Schools' own balance c. Credit purchase from book store d. Purchase by parents e. Purchase from other sources (NGO, INGO) f. Others than above mentioned	
7.1.3	If Yes, when did you receive budget from DEO for textbook?	dd/mm/yy	
7.1.4	At this time, how many books they got ? Please mention one	a. All got complete set b. All got incomplete set c. Half got complete set and half got incomplete set	
7.1.5	If no, what was the reason for not getting books on time? Please mention one	a. Book grants for textbooks received late b. Books are not available in the local book stores	

		c) Do not know d. Others	
7.1.6	Do you receive textbooks amount according the Flash I information provided by you?	a. Yes b. No	
7.1.7	When did you submit the school's Flash I Information for 2067 to Resource Center (RC) or DEO?	DD/MM/YY	
7.1.8	Did you find any difficulty in providing Flash I information?	a. Yes b. No	
7.1.9	If yes, what difficulties did you face? Give three major 3 difficulties	a. Uncertain enrollment b. Too disaggregated information c. School not maintaining such detailed information d. Not understanding the concept of the information e. Too lengthy	1st difficulty: 2nd.difficulty: 3rd. difficulty:
7.1.10	What is the textbook budget you have received for primary level in School Years 2065 and 2066?	School Year : 2065	NRs.
		School Year : 2066	NRs.

5.6 (D) Textbook distribution and availability, 2068 School Year (Private school).

S. No	Question		
7.2.1	Last year (2067), did your school/ all students buy or receive textbook before starting the school session ?	a. Yes b. No	
7.2.2	If No, how do you manage for those without Textbooks?		
7.2.3	Did your school/ all students buy or receive textbook before starting the school session this year 2068?	a. Yes b. No	
7.2.4	If No, how do you manage for those without Textbooks? Please mention one	a. Teach the student without book. b. School provides a few book to few students c. Credit purchase from book store d. Others than above mentioned	

5.7 (D) Fees and charges [all schools]

S. No	Question		
8.1	What is your annual registration fee for primary school students?		
8.2	What is your monthly fee for primary school students?		
8.3	List other fees that apply to primary age pupils [state if per month or per year]	a. examination fee b. computing fee c. library fee d. other	
8.4	What is your boarding fee for primary school students?		

5.8 (D) Teachers

S. No	Question	Unit	Value
9.1	How many of the total teachers in this school belong to:	Male = Female = **Total Number =**	Janjatis = Dalits = Madeshi = Disabled =
9.2	How many teachers are present and teaching in this school today?	Male = Female = **Total Number**	Janjatis = Dalits = Madeshi = Disabled =
9.3	Have any teachers been fired or laid off in the academic year 2066/067 (2009/10)?	Number fired/laid off	
9.4	For each of the teachers most recently fired (up to 3, in 2066/067 (2009/10), what was the reason for firing the teacher?	1 =Absenteeism 2 =Abuse of children 3 =Bad teaching 4 =Services no longer	# 1 Teacher: # 2 Teacher: # 3 Teacher:

		needed /redundant 5=Conflicts with staff 6 =Other	
9.5	How many teaching position are officially allocated to this school?	Number	
9.6	How many of the official positions are actually filled?	Number	
9.7	How many teachers transferred in 2066/067 (2009/10)??	Number	
9.8	How did transfer occur? who initiated it?	1 = By DEO 2 = By SMCs 3 = By self-request by teachers 4 = Recommended by HT 5 = others	#1 teacher: #2 teacher: #3 teacher:

5.9 (D) Profile of the Head Teacher:

10.1	**Full Name**		
10.2	Sex	a. Female	
		b. Male	
10.3	Age	Years	
10.4	Teaching Years	Years	
10.5	No of years as Head Teacher	Years	
10.6	Number of years as a head teacher at this school	Years	

10.7	Highest level of education completed?	a. Under SLC b. SLC c. I. Ed. d. Other Certificate level e. B. Ed. f. Other Bachelor level g. M.Ed. h) Other Masters level	**Division/ Rank and Major subject**
10.8	Have you organized monthly meeting with the teachers regularity ?	a. Yes, and it is recorded also b. Yes, but not recorded c. No	
10.9	Which subject do you teach?	a. Math b. Nepali c. Other (Please specify)	
10.10	In your primary school, did all teachers complete the course?	a. Yes b. No	
10.11	If No, which subjects were not completed?		
10.12	Please mention the possible reasons for not completion of the course on time?	1. 2. 3.	
10.13	Do you the speak local language?	a. Yes b. No	
10.14	If Yes, mention the name of the language?	Name:	

Head teacher Training

10.15	Have received any sort of training ?	1. Yes 2. No	
10.16	What kind of training obtained ?	1. Full 2. Partial 3. None	
10.17	what was the duration of that training?	1. Less than one month 2. 3 to 6 month 3. 10 month 4. One year	
10.18	Have you recieved one month HT	a. Yes	

	training ?	b. No	
10.19	Have you recieved any sort of the training this year 2067 ?	a. Yes b. No	
10.20	If yes, what kind of training have you received?		

5.10 (D) Primary School Teacher (from school register with permission of the Head Teacher)

S. N.	Questions	Primary
11.1	How many teachers are working who get salary from DDC/NP and VDC ?	
11.2	How many teachers are working who get salary from NGO and INGO ?	
11.3	How many teachers are working who get salary from Schools' own source (community support)?	
11.4	How many teachers are getting salary from other source than above mentioned, including private fees ?	
11.5	Total number of teachers	

11.6	Total number of teachers in the following categories?	Highly Marginalized Janajati[3]	Dalits	Female	Disabled
11.7	Primary teachers in these categories?				

11.8	What are the educational levels of all teachers? Give the numbers.	Below SLC	SLC	Intermediate		Bachelor		Masters and Above	
				I.Ed.	Other PCL	B.Ed.	Others Bachelor	M. Ed.	Others Masters Level
11.9	Of Primary teachers?								
	Division/ Rank and Major subject								

[3] Highly Marginalized groups includes: Bankariya, Kusunda, Kushbadiya, Raute, Surel Hayu, Raji, Kisan, Lepcha, Meche, Santhal, Jhangad, Chepang, Thami, Majhi, Bote, Dhanuk (Rajbansi), Lhomi (Singsawa), Thudamba, Siyar (Chumba), Baramu, Danuwar. It is a combination of Endangered and highly margainalized groups catogorazed by Nepal Federation of Indigenours Nationalities

11.10	What are the training levels of all the teachers? Provide their number	Refresher Training	Full Trained[4] Teacher	One month subject training (secondary)	Others (more than one month)
11.11	Primary teachers' training levels				

11.12	Number of teachers ABSENT today.	Number	Male Number: Female Number:
11.13	Please give the reasons for the absence	a. Sickness b. Gone for training c. Gone for adminsitrative work d. On leave e. Other f. Don't know	

5.11 (D) Information for Math Teachers (For Grade-2 and 4)

S. No	Question		Primary
12.1	Is this district your home town place?	a. Yes b. No	
12.2	Is this district your birth place?	a. Yes b. No	
12.3	Highest education level attained.	a. Under SLC b. SLC c. IA d. I. ED. e. B. A. f. B. Ed. g. M. A. h) M. Ed.	**Division/ Rank and Major subject**
12.4	How many days were you absent this school?	School year 2067:	School Year 2068 :
12.5	If absent, why were you absent?	a. Sick b. Training c. Adminstratives duties need to Deo office d. Approved leave e. Don't know	

4

		f. Others	
12.6	How is the school managing the covering of classes in his/her absence?	a. Use relief teacher b. Combine classes c. Don't know d. Others	

12.7	How many hours have you/he to take classes in a week?	Hours	
12.8	Do you have other work also?	a. Yes b. No	
12.9	If yes, what do you do besides teaching?	a. Business b. Social service c. Agriculture d. Part time job elsewhere	
	How much monthly salary do you receive from this school?	Amount in NRs.=	
12.10	When does teacher recieve their salary?	g. Monthly h. Quarterly i. Trimesterly j. Others	
12.11	If late in getting last salary, what could be the reasons?	a. Late budget disbursement b. monthly submission of SOE not in time c. Inadequate school followup at DEOs d. Due to advance account not being cleared e. Others	1st reason 2nd reason
12.12	Did you complete the Math subject course during the last year (2067)?	a. Yes b. No	
12.13	Please mention the possible reasons for not completing the course on time?	1. 2. 3.	
12.14	How frequently do you give homework to your students?	1. Daily 2. Weekly 3. Monthly 4. Other (Specify)	
12.15	How do you provide the feedback to the student?		
12.16	How do you report to the HT?		

12.17	Have you met the students' parent ?	a. Yes b. No	
12.18	If Yes, how many times in a year?	1. one times 2. Two times 3. Three times 4. More than four times in a year. 5. Other (Specify)	
12.19	Do you have any formal examination system in your school?	a. Yes b. No	
12.20	If Yes, how many times you tested (a formal exam) taken in a year?	1. one times 2. Two times 3. Three times 4. More than four times in a year. 5. Other (Specify)	
12.21	Do you have any non- schduled test (may pre-exam) in your school?		
12.22	If Yes, how many times is a formal exam taken in a year?	1. one times 2. Two times 3. Three times 4. More than four times in a year. 5. Other (Specify)	
12.23	Do you prepare any formal report card system?	a. Yes b. No	
12.24	If Yes, how many times do you send that report to parents in a year?	1. one times 2. Two times 3. Three times 4. More than four times in a year. 5. Other (Specify)	

Training

12.25	Have you received any sort of training ?	3. Yes 4. No	
12.26	What kind of training obtained ?	4. Full 5. Partial 6. None	
12.27	Are you fully trained ?	a. Yes b. No	
12.29	what was the duration of that training?	1. Less than one month 2.3 to 6 month 3. 10 month 4. One year	
12.30	Have you recieved any sort of training this year 2067 ?	a. Yes b. No	
12.31	If yes, what kind of training have you		

	received?		
12.32	What specialist training in your subject have you ever received?		

5.12 (D) Information for Nepali Teachers (For Grade-2 and 4)

SN	Question		Primary
13.1	Is this district your home town place?	a. Yes b. No	
13.2	Is this district your birth place?	a. Yes b. No	
13.3	Highest education level attained.	a. Under SLC b. SLC c. IA d. I. ED. e. B. A. f. B. Ed. g. M. A. h) M. Ed.	**Division/ Rank and Major subject**
13.4	How many days were you absent this school?	School year 2067:	School Year 2068 :
13.5	If absent, why were you absent?	k. Sick l. Training m. Adminstratives duties need to Deo office n. Approved leave o. Don't know p. Others	
13.6	How is the school managing the covering of classes in his/her absence?	e. Use relief teacher f. Combine classes g. Don't know h. Others	

13.7	How many hours have you/he to take classes in a week?	Hours	
13.8	Do you have other work also?	a. Yes	

		b. No	
13.9	If yes, what do you do besides teaching?	a. Business b. Social service c. Agriculture d. Part time job elsewhere	
	How much monthly salary do you receive from this school?	Amount in NRs.=	
13.10	When does teacher recieve their salary?	q. Monthly r. Quarterly s. Trimesterly t. Others	
13.11	If late in getting last salary, what could be the reasons?	a. Late budget disbursement b. monthly submission of SOE not in time c. Inadequate school followup at DEOs d. Due to advance account not being cleared e. Others	1st reason 2nd reason
13.12	Did you complete the Nepali subject course during the last year (2067)?	a. Yes b. No	
13.13	Please mention the possible reasons for not completing the course on time?	1. 2. 3.	
13.14	How frequently do you give homework to your students?	5. Daily 6. Weekly 7. Monthly 8. Other (Specify)	
13.15	How do you provide the feedback to the student?		
13.16	How do you report to the HT?		
13.17	Have you met the students' parent ?	a. Yes b. No	
13.18	If Yes, how many times in a year?	6. one times 7. Two times 8. Three times 9. More than four times in a year. 10. Other (Specify)	
13.19	Do you have any formal examination system in your school?	a. Yes b. No	
13.20	If Yes, how many times you tested (a formal exam) taken in a year?	6. one times 7. Two times 8. Three times 9. More than four times in a year.	

		10. Other (Specify)	
13.21	Do you have any non- schduled test (may pre-exam) in your school?		
13.22	If Yes, how many times is a formal exam taken in a year?	6. one times 7. Two times 8. Three times 9. More than four times in a year. 10. Other (Specify)	
13.23	Do you prepare any formal report card system?	a. Yes b. No	
13.24	If Yes, how many times do you send that report to parents in a year?	6. one times 7. Two times 8. Three times 9. More than four times in a year. 10. Other (Specify)	

Training

13.25	Have you received any sort of training ?	5. Yes 6. No	
13.26	What kind of training obtained ?	7. Full 8. Partial 9. None	
13.27	Are you fully trained ?	a. Yes b. No	
13.29	what was the duration of that training?	1. Less than one month 2.3 to 6 month 3. 10 month 4. One year	
13.30	Have you recieved any sort of training this year 2067 ?	a. Yes b. No	
13.31	If yes, what kind of training have you received?		
13.32	What specialist training in your subject have you ever received?		

5.13 (D) Available physical facilities at school - PRIMARY school only

(RA required to see in the class room)

School Infrastructure:

14.1	Does the school have its own building?	1. Yes 2. No	
14.2	What sort of school buildings do you have?	1. Pakki 2. Kachhi	
14.3	What types of roof?	1 = Khar or thatched roof 2 = Slate 3 = Tin 4 = RCC 5 =others	
14.4	Is there any earthquake resistance provision in “Pakki" classrooms ?	a. Yes b. No c. Do not know	

Primary Classrooms:

14.5	How many classrooms have a roof that leaks when it rains?	Number:	
14.6	How many class rooms have a chair and a table for the teacher?	Number:	
14.7	Does the school have blackboards in all class rooms?	a. Yes b. No	
14.8	Does the school have classrooms neat and tidy?	a. Yes b. No	
14.9	Does every class room have proper ventilation and enough lighting ?	a. Yes (Every class room has proper ventilation) b. Some what, most of the classrooms have proper ventalation and lighting. c. No, most of the classrooms do not	

		have proper ventilation and lighting.	
14.10	Is there adequate furniture (desk / bench)?	a. Yes b. No	
14.11	Does the school have a play ground?	a. Yes b. No	
14.12	Is the school compound fenced?	a. Yes b. No	
14.13	Are there any newly constructed buildings or classrooms during year 2067?	a. Yes b. No	
14.14	If Yes, how many new classrooms are made in school year 2068 ?	Number	
14.15	For what purpose are the new classrooms or new buildings constructed?	1. for class room 2. for office 3. for other academic programs 4. others (specify	
14.16	And how many classrooms were rehabilitated in school year 2068?	Number	

14.17	Do you have library?	a. Yes b. No	
14.18	How many books are there in the library? Who uses it? 1. students 2. teachers 3. both of the above	Number of Books	
14.19	Do you have Electricity in School ?	a. Yes b. No	
14.20	Do you have computer?	a. Yes b. No	
14.21	How many computers are there in the school?	Number of computers	
14.22	Do you have drinking water facilities in School ?	a. Yes b. No	

14.23	If no, how they will manage it?		
14.24	Does the school have separate toilet facilities for girls?	a. Yes b. No	
14.25	Does the school have separate toilets for boys?	a. Yes b. No	
14.26	Does the school have separate toilet for male and famle teachers?	a. Yes b. No	
14.27	What are the main sources of drinking water at this school?	a. None b. Rain water Tank c. Well/ bore hole d. Pipe e. Other	

Management and Study Support for children

14.28	Has this school transferred to the community under the recent policy of transfer of schools to community management ?	a. Yes b. No	
14.29	What was the driving factor in taking over the management from the government?	a. community willing to take up the responsibility b. Block grant and autonomy granted c. Initial seed money d. Autonomy desired e. Others (specify).	
14.30	Does the school have an academic calendar ?	a. Yes b. No	
14.31	If no, what are the reasons for not achieving an academic calender?	a. Need not being felt b. Not possible to operate a calender, not used to it. c. Others	Reason-1: Reason-2:
14.32	What is the number of school days need to open as per Education Rules Regulation(ERR)?	Number of days :	

		Number of days classes are taken:	
14.33	If the number is less than stipulated in the rules, kindly provide the reasons?	a. Geographical- snow, rain etc. b. Agriculture activities c. Others	
14.34	How many academic days have you lost ?	Number of days:.....	
14.35	What are the reasons?	a. Bandhas general strikes b. Call for school closure due to political pressure c. Other	Reason-1: Reason-2:
14.36	Does the school receive any newspaper?	a. Yes b. No	
14.37	Does the school have a meal program for the students?	1 =Yes 2 =No	
14.38	If yes, what is the program? Is this	1. WFP lunch program 2. Distribution of edible oil 3. Other	

5.14 (D) Financial Management and Accounts (government schools)

SN	Questions		
14.1	Have you submitted your annual budget to DEO for FY 2067/2068?	a. Yes b. No	
14.2	If you have not prepared any budget then did you prepare trimester budget demand sheet for the last trimester ?	a. Yes b. No	
14.3	when did you submit your annual budget or budget demand to DEO?	dd/mm/yy	
14.4	Was the amount approved by DEO same as requested by school?	a. Yes b. No	
14.5	If No, which budget item received less than requested ? Please mention 3 headings.	1. Salary and Allowance 2. Textbook	1st 2nd

		3. Scholarship 4. Block Grants 5. Constructions 6. Others	3rd
14.6	Was any consultation made before cutting the budget?	a. Yes b. No	
14.7	If SIP is used as a planning document, how is it used? Give two important uses it was put. Please mention any two	a. Not used at all b. for overall budget preparation c. for identifying some capital expenses d. for identifying some other development programs 4- Others	1st. use 2nd. Use
14.8	If no, why SIP is not used for budget formulation? Give two main reasons.	a. SIP is good for planning capital budget only and annual budget is mostly recurrent in nature b. SIP is over ambitious and DEO never indicated to allot resources accordingly. u. Budget is never a serious exercise and it is incremental.	1st Reason: 2nd. Reason

14.9	Which books of accounts are maintained by school? Give yes (1) or no (2) answer against each of the items.	1.Income Ledger 2. Expenditures Details Ledger 3. Monthly Income and Expenditures Ledger 4. Fee Ledger 5. Advance Ledger 6. Scholarship Distribution Ledger 7. Free Textbook Distribution Ledger 8. Fixed Assets Ledger 9. Bank Ledger	1. Yes/ No 2. Yes/ No 3. Yes/ No 4. Yes/ No 5. Yes/ No 6. Yes/ No 7. Yes/ No 8. Yes/ No

		10. Other (Specify)	9. Yes/ No 10. Yes/ No
14.10	Did your School receive the Block Grants in accordance to the data available in Flash I Reports for the fiscal year 2067/68 ?	a. Yes b. No	
14.11	If, you have not received same amount as Flash I has indicated. Please mentioned it is less or more ?	a. Less b. More	
14.12	Have you completed your Financial Audit for FY 2067/2068?	a. Yes b. No	
14.13	If yes, are there any audit objections?	a. Yes b. No	
14.14	If yes, what sort of objections has audit report raised? Give two main objections	a. not according to rules and regulations b. Lack of required documents c. Not followed approved process d. others	1st. type: 2nd. type:
14.15	In which budget items were objections made by the auditor ? Give three main items.	1. Salary and allowances 2. Scholarship 3. Textbook 4. Construction 5. Advances settlement 6. Others	1st, item: 2nd. Item: 3rd. Item

Financial Management and Accounts (private schools)

SN	Questions		
14.16	Is this school: a. registered under the Company Act? b. a public trust? c. a private trust? d. None of these		
14.17	Who plans manages the school's accounts?	a. Founder/principal b. Family member c. School accountant – employee d. Outside accountant	

14.18	Do you have a loan from the bank?		
14.19	What are your main financial concerns?	a. Conflict with parents over fee levels b. Non-payment of fees c. Need for capital funds d. Political situation e. Other – please state	
14.20	Did the school make a surplus last year?	Yes/no	
14.21	Do you pay tax to the government?	Yes/no	

5.15 (D) b Supervision and accountability – all school

SN	Question			Description
15.1	Total number of visits by government officials (at all levels), resource persons, DDC/VDC officials, etc.)		Number of times	
15.2	Number of monitoring visits by each of the office staffs.	a. Dept. staffs b. Regional office staffs c. DEO staffs d. District Education Committee members e. Resource persons f. School supervisors g. DDC/VDC staffs	visits number	a b c d e f g

15.3	What was the objectives of the monitoring ?	a. For research b. Classroom observation c. Administrative supervision d. To check school record e. To monitor scholarship distribution f. To participate schools function (g) Others		First Objective Second Objective Third Objective
15.4	During the monitoring whom they have contacted ?	a. Head Teacher b. Other Teacher c. SMC members d. PTA members & Parents	a)Contacted b) Not contacted	a b c d

		e. Students		e
15.5	In what way, schools received reports such for visits from respective agencies?	a. No any report b. Verbal report to H.T c. Verbal report to Teachers d. Written report to H.T e. Written report to Teachers f. Verbal report to SMC g. Written report to SMC h. Written report to whole school management		First Second Third
15.6	Please provide the composition of School Management Committee (SMC).		Male = Female = Total = Chairperson = Male/ Female	Brhmin/ Chhetri = Janjatis = Dalits = Madeshi = Total =
15.7	Last year (2067), how many times SMC meetings are held ? (please, ask with HTs for a meeting minutes register as well).			
15.8	In this school year 2068 how many times SMC meetings are held ?			
15.9	What was last meeting main decision?		Building = Teacher = Textbook = Scholarship = Others =	
16.10	Number of class operation days (not school opening days)		Number	
15.11	Number of days loss due to bandh in this school year 2068.		Number	
15.12	Was Social Audit completed last year?		Yes No	

5.15 (D) Student Questionnaire

SN	Description		
1	**Name of Child**	**Age:**	**Gender:**
	Religion:	**Caste:**	**Ethnicity:**
2	What language do you speak at home?		
3	Do you live with your parent (Father and Mother)?	a. Yes b. No	
4	Can your parents read and write Nepali ?	a. Yes b. No	
5	Please provide your parents, highest level of education.	**Father**	**Mother**
6	1. Simple read and write 2. Primary school completed 3. SLC level of education 4. College and university level of education		
7	Do you like going to your school?	a. Yes b. No	
8	If Yes, what do you like most in your school?	1. School Building 2. Play ground 3. Head Teacher/ Teachers 4. Peer (friend) 5. Other (Specify)	
9	How much time does it take you to travel from your home to your school each day?	Minutes/Hours	
10	Are you the first, second, third, and fourth child at your home?		
11	In what language are most of your class subjects taught?	1. Nepali 2. English 3. Both 4. Other (Specify)	
12	Approximately, how many books are there in your home excluded your text books?	Number =	
13	Do your have any newspaper available at your home?	a. Yes b. No	
14	Does anybody support your study at home?	a. Yes b. No	
15	If Yes, who supports you?	a. Father	

		b. Mother c. Sister/ Brother d. private tutor e. Others (Specify).	

	SN	Description		
	16	How frequently do they support you?	Regularly (Daily) Sometimes As per request Other (Specify)	
	17	Does your family buy study materials (such as pencil, copy, and stationery)?	a. Yes b. No	
	18	If yes, who will buy?	a. Father b. Mother c. Others	
	19	Were you absent from the school during this recent two months?	a. Yes b. No	
	20	If Yes, how many school days were you absent?	Month: June Days: Month July Days:	
	21	Why were you absent? Please give the reasons.		
	22	Do you have any brother/ sister in your family?	a. Yes b. No	
	23	If yes, please provide the detail:	1. Brother 2. Sister 3.	Education
	24	Does your school provide any extra curricular activities?	a. Yes b. No	
	25	If Yes, what types of activities do they provide for you?	1. Sport 2. Dancing and Singing 3. Essay and Poem competition 4. Others	
	26	Have you passed previous year class?	a. Yes b. No	
	27	If Yes, please provide the previous year achievement: (Score)	Mathematics = Nepali =	in %

			Total (all subjects) =	
	28	Do you study regularly at your home?	a. Yes b. No	
	29	If Yes, how much time do you study in the home, per day?	1. ½ hours 2. 1 hour 3. 1.5 hours 4. 2 hours	
	30	Do you need to spend time on household work for your family before and after actual school time?	a. Yes b. No	
	31	If yes, what kind of work?	1. To support in kitchen for cooking 2. To carry water 3. To take care for siblings 4. Other (Specify)	
	SN	**Description**		
	32	What types assets do you have at your home?	1. Vehicles: Car/ Motorcycle/ Bicycle 2. Entertainment Equipment: TV, Video, Tape Radio, Radio 3. Telephone, Mobile Phone, Wall clock.	

Information about Peers

SN	**Description**		
	At school Level:		
33	How many friends sit with you at your desk?	Three, Four, Five, Six and above.	
34	Please mention their names and last year (2067) score in Maths and Nepali (See school record).	Name 1. 2. 3. 4. 5. 6.	Good score Average score Low score

35	Who are your best friends? (Give three names)	1. 2. 3.	
	At Household level:		
36	How many friends do you have at home? Two, Three, Four and above. Who are they?	1. Sister/ brother 2. Other relatives (specify) 3. Neighbours 4. Others	
37	Who is your best friend?		
38	If you have other friends except your school mates, please mention their name and their Last year's achievement (ask with childrens' parent).	1. 2. 3.	Good score Average score Low score

Homework and Feedback:

SN	Description		
39	Do your school/ teacher give homework on Math and Nepali subjects to you?	a. Yes b. No	
40	If yes, how frequently does the teacher give you homework?	1. Sometimes (per week one Or two time) 2. Daily 3. Monthly	
41	Does the teacher check your home work? (If yes, please ask the child to show the copy to check)	a. Yes b. No	
42	Does the teacher provide feedback to you?	a. Yes b. No	
43	If Yes, what kind of feedback do they provide to you? (please check child's copy).	1. Verbal 2. Written 3. Special Note 4. Other (Specify)	
44	Who will support or stay while you are doing your homework?	1. Parent (Father/Mother) 2. Sister/brother 3. Private tutors 4. Friend 5. Alone or her/him self 6. Others	

Observation:

SN	Description		
45	Does the child have a school bag?	a. Yes b. No	
46	If yes, how many books are in the child's school bag	Number:	
47	Do they have Mathematics and Nepali with them?	a. Yes b. No	
48	Other educational materials: Such as Pencil Copy Bag		
49	Do they wear school uniform?	a. Yes b. No	
50	Do they wear shoes/ sandal or bare foot/nothing?	a. Yes b. No	
51	Do they bring tiffin with them?	a. Yes b. No	

5.16 (D) Family Level Questionnair

A. Personal Details

SN	Description		
1.0	Name: (Mr/Mrs./Ms.)	Age:	Gender:
	Religion:	Caste:	Ethnicity:
2.0	Language spoken at home other than Nepali.		
2.2	How long have you lived in this place(village/town)?	Less than One year 1-2 Years 2-5 Years More than 5 year	
2.3	Do you have/own land?	1. Yes 2. No	
2.4	If Yes, how much land do you have?	In Ropani or Bigha	
2.5	Do you own livestock?	1. Yes 2. No	
2.6	If Yes, Please provide the number.	Cows, Bulls and Buffalo = Goat/Sheeps = Poultry = Other animals =	
2.7	For each of your children, say their sex, age and which school they attend	Sex/age 1. 2. 3. 4. 5. 6.	School 1 2 3 4 5 6
2.8	If they go to different schools, say why		
2.9	Do you any other school-aged children who do not go to school?		
2.10	If yes, what is the reason?	a. Poor health of child b. Needed for household work c. Family's poor economic situation d. Child not interested e. Other (specify)	

2.11	Do you like to send target child to their school?	a. Yes b. No	
2.12	If yes, what are reasons for sending your children to this school? (Give three most important reasons)	1. Near 2. Good school facilities 3. Head Teacher and Teachers are good 4. Scholarship offer by school 5. elders and relative studying in this school 6. There is no alternative chioce 7. They charge cheap tution fee compared to other schools 8. Others (Specify)	
2.13	How do you evaluate the study performance of your children in this school?	9. Mostly good 10. Fairly good 11. Not so good 12. We/I do not know 13. Other (Specify)	
	School characteristics **(target child)**	**Good Moderate Poor**	
2.14	1. School Infrastructures 2. Head Teacher 3. Subject Teachers 4. Interaction between school and parent 5. Extra-co curricular activities 6. Other (Specify)		
2.15	Do the school call you to visit the school?	1. Yes 2. No	
2.14	If yes, last year (2067), how many times did you visit the school?	1. One 2. Two 3. Three 4. Four 5. More than	
2.15	What was the reasons? Please mention.	1. About progress/ results of the children 2. Discuss infrastructure 3. Discuss management of school, eg SMC election 4. Other - specify	
2.16	Do you have any other government/ private school near by your location?	1. Yes 2. No	
2.17	If yes, are you thinking that target child will be transfer to that school next year?	1. Yes 2. No	
2.18	If yes, why?		

B. Study support for target child

2.19	Do you support your child at home in their study?	1. Yes 2. No	
2.20	If Yes, how much time to support?	Hours/day	
2.21	If Yes, who supports her/him?	a. Father b. Mother c. Sister/ Brother d. private tutor e. others (Specify).	
2.22	How frequently do you buy study materials such pencil, copy, ink, and colour ?	1. Weekly, 2. monthly or 3. as requested by the child 4. Other (Specify)	
2.23	Approximately, how many books are there in your home excluding your children's text books?	Number =	
2.24	Do your have any newspaper available at your home?	a. Yes b. No	

C. Occupation

2.25	**Occupation:**		
	Please provide the occupation of:	**Father**	**Mother**
	House wife/Men agriculture		
	Manual wage earner		
	Non-manual earner		
	Professional (e.g. doctor, engineer, nurse etc.)		

Working abroad:

2.29	Do you have any family member employed /working abroad?	1. Yes 2. No	
2.30	If yes, which country?	1. India 2. Gulf countries 3. Arabian countries 4. European countries	

2.31	What his/her monthly salary?	**NRs. ….**	
2.32	What type of job?	1. Permanent 2. Contract 3. Other	
2.33	What categories of employment?	1. manual 2. non-manual 3. professional	

D. Equipment and Assets:

2.34	Please say which of these equipment and assets do you have?	1.Yes 2. No	
	Computer		
	Telephone		
	Internet		
	Mobile Phone		
	Television (TV)		
	Video		
	Tape-Recorder		
	Radio		
	Vehicles Car Truck/Tractor Motorbike Cycle		
	Other (specify)		

E. Approximate annual Income and Expenditure

SN	Income	Expenditure
2.35	Job/Employment	Food
	Agriculture	Health
	Livestock	Education
	Rent income	Rent paid
	Other	Other
	TOTAL	TOTAL

F. Approximately Wealth (value of the property)

Description	Quantity	Amount (in Nrs.)
Land		
Building		
Valuable Items (such Gold, silver etc.)		
Share of the company/ Fixed deposit in financial institution		
Other		
TOTAL		

G. Standard of living

2.34	In your opinion, would you describe your family's standard of living as		
	Poor standard of living		
	Average standard of living		
	Above average standard of living		